



Digitized by the Internet Archive
in 2014

<https://archive.org/details/annualreportofne1979newy>

New York Zoological Society

A N N U A L R E P O R T 1 9 7 9

New York Zoological Society

A N N U A L R E P O R T 1 9 7 9

Report of the President	2
Report of the General Director	4
New York Zoological Park	8
Department of Ornithology	9
Department of Mammalogy	10
Department of Herpetology	12
Zoo Education Department	14
Wildlife Survival Center	16
New York Aquarium	18
Aquarium Education Department	19
Osborn Laboratories of Marine Sciences	21
Animal Research and Conservation Center	22
Field Projects Around the World	24
Animal Health	26
1979 Scientific Publications and Papers	28
Exhibition and Graphic Arts	30
Personnel	31
Visitor Services	31
Operations	31
Publications and Public Relations	32
Development and Membership	34
Report of the Treasurer	36
Audited Financial Statements	37
Contributions	45
Board of Trustees and Committees of the New York Zoological Society	49
Staff of the New York Zoological Society	52



In the tradition of making a good exhibit even better, Wolf Wood was enlarged, and six young tundra wolves were added to the pack.

Assistant Mammal Superintendent Frank Casella helped the eight-month-old females, who had been hand-reared, adjust to their new home.



In 1979, the New York Zoological Society's exhibition and education programs at the Bronx Zoo and New York Aquarium brought 1,592,628 visitors to the Zoo and 398,767 to the Aquarium. We celebrated the eightieth anniversary of the opening of the Bronx Zoo; we planned or engaged in the construction or reconstruction of ten major exhibitions and teaching facilities at the Zoo and Aquarium; we bred hundreds of rare and endangered animals; we cooperated with several foreign governments in the pursuit of our goals to preserve wild places and wild creatures; and we made some significant institutional changes to strengthen our wildlife research and conservation programs. These accomplishments are all reported on in detail in the following pages.

An analysis of the Society's income and expenses in 1979 is included in the Treasurer's report, but I would like to point out that the Society's overall expenditures in 1979 amounted to \$16,005,383. Our income fell short of expenditures by \$584,603.

However, under Chairman John N. Irwin II and Vice-chairmen Mrs. Vincent Astor, John Pierrepont, and John T. Sargent, the Animal Kingdom Fund grew to \$9,400,000 by year's end. The major gifts to the Fund were received from Lila Acheson Wallace, the Kresge Foundation, and the National Endowment for the Arts. This Federal grant, \$500,000 to be matched three-to-one, is the largest challenge grant ever awarded by the NEA to a zoological organization.

The Society's campaign for annual corporate support was led in 1979 by the thirty-seven members of the Business Committee under the co-chairmanship of Edgar M. Cullman and John Elliott, Jr. The campaign raised \$347,000, a 26 percent increase over 1978. In addition, corporate gifts of \$25,000 or more, not for annual

operating purposes but for the Animal Kingdom Fund, were received from Chemical Bank, the Grace Foundation, Morgan Guaranty Trust Company, New York Telephone, and Philip Morris.

The Women's Committee, with over 200 members, was chaired through September by Mrs. Harmon L. Remmel and afterward by Mrs. Driggs Hultkrans. The Committee's major fundraising event in June netted \$150,000 toward the costs of the Zoo's new exhibition for gelada baboons. The Board is grateful for the work of Mrs. Remmel, Mrs. Joseph A. Thomas, and the Committee for its work in this past year.

There have been a number of changes among our Trustees and Advisors. Robert Winthrop, a Trustee for nineteen years, resigned and has joined the Board of Advisors. Richard Purnell and C. Sims Farr were elected Trustees, and Mrs. Edgar M. Cullman and Walter E. Teagle III were elected Advisors, as was Mrs. Driggs Hultkrans, the new Chairman of the Women's Committee. John Pierrepont, formerly Treasurer, was elected Vice-President, and David T. Schiff, previously Chairman of the Finance Committee, became Treasurer. He was, in turn, succeeded by Frederick A. Melhado as Chairman of the Finance Committee. Frank Y. Larkin was appointed Chairman of the Conservation Committee.

The successful completion of another year in the Society's history is due to the continued efforts and devotion of the Trustees, the staff, the membership, our volunteers, including especially the Friends of the Zoo, and our many donors.

Howard Phipps, Jr.
President

REPORT OF THE GENERA



Zoos are becoming the last outpost for many endangered animals, such as this romping herd of Grevy zebras on the African Veldt. Captive breeding is increasingly important as the numbers of animals decline in the wild.



"At three o'clock the procession of carriages and hacks drew up at the Northwest Gate ... and the first carriage rolled through. It bore the Honorable Levi P. Morton, one-time Vice-President of the United States, former Governor of New York, and now the New York Zoological Society's second president. ... It was an overcast day, with a cold northwest wind, and the speech-making from the bunting-draped platform in front of the Bird House was mercifully short."*

It was eighty years ago, November 8, 1899, and it was the opening of the New York Zoological Park.

AT EIGHTY, A NEW KIND OF INSTITUTION

An eightieth anniversary for the Zoo (eighty-fourth for the Zoological Society) might seem to offer a tempting vantage point from which to look back. However, the Society's history tells us that an institution devoted to live wild animals and to man's relationships with them must have an overwhelming concern with the future. Neither a static warehouse of natural artifacts nor an historical collection of unchanging objects, the living breeding collections of zoos and aquariums make them museums of the here and now and, increasingly, repositories for the future. Quite suddenly zoos are beginning to be seen as a new kind of institution, and the reasons for this are clear.

Biologists now estimate that between 600,000 and one million species of plants and animals will become extinct during the next two decades as a result of continuing human population increase and the consequent loss of habitat. Tropical moist forests, home for the greatest diversity of animal and plant species on earth, are being felled at the rate of nearly fifty acres each minute—an area the size of Massachusetts being converted to other uses every month. And this is not just a problem of foreign lands. Pressures upon our own nation's resources include the annual loss of about three million acres of agricultural land to urban sprawl and other developments. Nor is the destruction restricted to the land. Twenty-five of the world's most valuable fisheries are now seriously depleted. For example, the northwest Atlantic cod fishery is now yielding only one-third of its probable sustainable potential, and the catch has dropped 20 percent (to about 800,000 tons) during the past six years. While these kinds of degradation can be readily observed and their effects predicted to some extent, their meanings for the earth's basic climate and atmospheric chemistry remain an ill-defined long-term threat.

The essence of the New York Zoological Society has been its fortunate marriage of institutional disciplines: a zoological garden, an aquarium, a laboratory of marine sciences, an international conservation and research effort, and a local educational program. The constant interaction of these parts with the combined

pressures of accelerating environmental change and a new understanding of it, as well as with one another, has given rise to a renewed sense of direction and responsibility for the 1980s.

If human beings are to respond to the declining ability of their environment to support them, they must understand, they must care, and they must act. It is a function of the Zoo and Aquarium to help make them care and to aid them to understand. It is a goal of the Society's scientific programs to provide basic information essential to understanding and to rational action, and it is the mission of the conservation and captive propagation programs to act in order to save "pieces of nature"—to help preserve options for the future. In sum, that is a new kind of institution.

TO REACH MORE

Zoos and aquariums can no longer be simply collections of curiosities, like netsukes on a shelf, without reference to their environmental interrelationships, their relevance to man and to the future. Their exhibit messages must reach more people more compellingly.

Affecting more people, more compellingly, promises to be a major result of the negotiations with New York City's Department of Parks and Recreation for assumption of the management of the City's zoos in Central Park, Prospect Park, and Flushing Meadows Park. Nearly complete at year's end, the latest round in a decades-old discussion of Zoological Society operation for the Park Department zoos owed its progress, in no small measure, to the personal concern and understanding of Commissioner of Parks Gordon Davis. If the proposed contract becomes reality, renovation of the Central Park Zoo may begin as early as 1981 and the Society could be operating it by 1983 or 1984, with improvements and operation for the other zoos following at nearly the same time. Prospects are for an ultimate total attendance at the entire New York City zoological complex of more than five million each year. At year's end, Zoo Education Curator Richard Lattis was appointed Director of the City Zoos Project, and planning for the renovations was beginning.

**Gathering of Animals* by William Bridges (Harper and Row, 1974)

MORE BEGINNINGS

There were more beginnings at the Bronx Zoo and the New York Aquarium. At the latter, a Shark Hall featuring new ways of looking at these feared fishes was ready for a spring 1980 opening, and at the Zoo a greatly extended and enhanced Wolf Wood was completed. Reconstruction of the 1899 Flying Cage began; it will open in 1981 as an exhibition of penguins, cormorants, terns, and gulls, and as an exposition of the significance of colonialism. A totally new building to replace the deteriorated Antelope House took shape as a major element in "Africa," a segment in the Society's program of zoogeographic exhibits. Just as importantly, it will be a breeding facility for three endangered species. Work also began upon a new Children's Zoo designed especially with the city-child in mind—the first of its kind to break the mold of "cuteness" themes for children's zoos with a serious presentation of ecology and its mechanisms. It will also be fun.

Slowly, ever so slowly, yet another major Bronx Zoo building is beginning to take shape. It was initiated by a gift from the Vincent Astor Foundation for planning and engineering, and the basic shell is being constructed under a grant from the Federal Local Public Works Administration. Called the Jungle Building, the new structure will be devoted to the presentation of a slice of tropical moist forest in Asia, the most complex and rapidly disappearing habitat of its endangered kind. Highly experimental, the new building will attempt to present Asian primates and other animals in living environments in major breeding groups. It will be the indoor segment for the outdoor Wild Asia zoogeographic exhibit completed in 1977.

WINTER ZOO

"Winter Zoo" is, as yet, no more than a concept, a response to the need to bring more people to the Zoo over more of the year, and to the opportunity to use a remarkable asset already in hand—Baird Court.

A formal assemblage of six graceful *beaux-arts* buildings constructed mostly between 1902 and 1907, Baird Court is beautifully proportioned and handsomely situated at the center of the Zoo. Today, the old Bird House and Elephant House stand vacant, with replacement exhibits already in line for the Monkey House and much of the Lion House. The Court will soon be ready for re-use—as "Winter Zoo."

Plans call for the removal of comparatively undistinguished structures such as the Penguin House, the Small Mammals House, the Ostrich House, and, eventually, the Great Apes Building, and the re-use of the Court buildings: a multi-climate exhibit (penguin ice shelf vs. tropical forest edge) at the Monkey House; "Zoo Center" (an orientation area, meeting place, restaurant,

and series of expositions of living animal societies) at the old Elephant House; a "Man and Monkey" Exhibit, including spectacular treetop habitats, at the Lion House; and the use of the old Bird House for an expansion of the education department. The end result will be a spectacular series of wild-animal exhibits, joined by interconnecting walkways close to two major parking lots, and including enlarged education facilities with lecture halls, sales outlets, and an auditorium. It will be a comfortable and exciting visit for the Zoo-goer in the winter in a setting worth preserving. At the same time, the removal of less important structures will reduce operating costs and return important parts of the Zoo to park land.

CONSERVATION A NEW

Park land is a special concern for the Society's conservation program, which is now undergoing major changes and increasing priority. Dr. George B. Schaller, formerly Coordinator of the Society's Center for Wildlife Conservation and Research, became Director of Conservation upon the resignation of Dr. F. Wayne King, who left to become director of the Florida State Museum. Based upon foundations established in part by Dr. King, new directions for the Society's international conservation program were set forth, and a search for additional staff begun. By the end of the year, a powerful new program was in place, new initiatives identified, and a special report in preparation. More importantly, during 1979 two new "pieces of nature" received protection, as a result of the Society's conservation programs, in Argentina and Brazil where additional refuges were gazetted for large aggregations of wild animals.

PROPAGATION

Wild-animal species are "pieces of nature," too. Their propagation in captivity, when extinct in nature, preserves the opportunity to reconsider, to learn, and, perhaps, to reintroduce animals to former homes. More than 950 animals of 140 species were bred at the Zoo and Aquarium in 1979. Efforts to develop reintroduction programs for the extinct Pere David deer of China and the wild horse of Mongolia from captive stocks seem likely to bear fruit during the next few years.

Closer to home, the future of an equally spectacular species is at stake. Now believed to number less than thirty, the California condor is making its last stand in an area north of Los Angeles. Not more than one chick has been produced successfully during the past three years. The population is now so reduced that the loss of even a single specimen from the two or three pairs that may be breeding could spell the end of the nation's largest flying land bird. Captive propagation may be the only hope.

An aerial view, taken by the Society's staff photographers, captures the formal serenity and grace of the Zoo's Baird Court.



Although diminished in numbers, the Andean condor still dwells in some hundreds in South America. Its breeding habits resemble those of the California bird and more than thirteen zoos have bred the species. The Zoological Society, along with the Department of the Interior's Patuxent facility now have intensive propagating programs. During 1979, five condors were reared at the Zoo. Plans are being developed with Dr. Stanley Temple of the University of Wisconsin to attempt a reintroduction of 1980 chicks in Peru. This project will enable us to understand some of the difficulties that will have to be overcome if it should be decided to attempt to breed the California condor in captivity. Such is another direction in the Society's program to save "pieces of nature."

STAFF CHANGES

In addition to the new positions for George Schaller and Richard Lattis, already mentioned, James G. Doherty was appointed General Curator for the Zoological Park, and Joan Van Haasteren was appointed Curator of Public Relations and Promotions.

William Conway
General Director



In addition to the knowledge and expertise that goes into a successful breeding program, there is also the caring. Raising Andean condors is a task to which Bird Superintendent Eric Edler brings a special touch.



DEPARTMENT OF ORNITHOLOGY

A long-term program to replace or to renovate the older bird exhibits in the Zoo which began in the early 1960s finally reached the great Flying Cage in 1979. Erected in 1899, the 152-foot-long, 55-foot-high structure is being repaired, painted, and covered with new fabric with funds provided by the City of New York. A generous grant from the Harry De Jur Foundation will be used to create an exciting new seabird habitat, which is scheduled to open in 1981.

At the World of Birds, renovation of the special exhibits hall will transform that area into a specially designed and equipped facility for hand-rearing birds. Slated to be ready for the 1980 breeding season, the new brooder room will not only provide space for an ever-expanding propagation program, but will also serve as an exhibit where visitors can see some of the delicate procedures involved in tending to the needs of a variety of young birds.

At the year's end, the Society's bird collection numbered 1,298+ specimens of 281 species and subspecies. Over 69 percent of all the birds accessioned during 1979 were hatched in the Zoo. Among the highlights of the breeding season were the hatching and rearing of thirteen cranes, four South American condors, and six Indian pigmy geese. The cranes included ten white-naped cranes, two hooded cranes, and one greater sandhill crane.

Both the concave-casqued hornbills and the Malayan wreath-billed hornbills at the World of Birds went to nest early in the year, and each pair hatched a single chick. Unfortunately, the Malayan chick did not survive.

Continued success with such regular breeders as tufted puffins, sunbitterns, peacock pheasants, woodhoopoes, and tawny frogmouths prompted further development of long-term cooperative propagation projects with the National Zoo in Washington, D.C., and the Philadelphia Zoo.

Government restrictions continued to impose serious problems for the acquisition of new birds, but a number of important specimens were acquired from other zoos and propagators by loan or trade. Most notable among these acquisitions for the year was a female double-wattled cassowary, a young female white-naped crane, and a pair of Renault's ground cuckoos.

A re-evaluation and reduction of the waterfowl collection occurred with the closing of two ponds as construction began on the new Children's Zoo. A total of 196 ducks, geese, and swans were sent to 18 zoos and private aviculturists.

Curatorial research continued to center on perfecting methods for artificial insemination, sex determination, incubation, and hand-rearing techniques.

BIRD COLLECTION, BRONX ZOO, AT DECEMBER 31, 1979

Order:	Families	Species	Specimens
<i>Struthioniformes</i> — Ostriches	1	1	3
<i>Rheiformes</i> — Rheas	1	1	12
<i>Casuariiformes</i> — Cassowaries, emu	2	2	6
<i>Tinamiformes</i> — Tinamous	1	2	10
<i>Sphenisciformes</i> — Penguins	1	3	9
<i>Pelecaniformes</i> — Pelicans, cormorants, etc.	2	4	18
<i>Ciconiiformes</i> — Herons, ibises, storks, flamingos, etc.	4	18	101
<i>Anseriformes</i> — Swans, ducks, geese, screamers	2	53	246+
<i>Falconiformes</i> — Vultures, hawks, eagles	3	9	26
<i>Galliformes</i> — Quail, pheasants, etc.	3	19	173
<i>Gruiformes</i> — Hemipodes, cranes, trumpeters, etc.	5	20	123
<i>Charadriiformes</i> — Plovers, sandpipers, gulls, etc.	9	27	154+
<i>Columbiformes</i> — Pigeons, doves, sand-grouse	1	4	9
<i>Psittaciformes</i> — Parrots, etc.	1	15	36
<i>Cuculiformes</i> — Touracos, cuckoos	2	8	26
<i>Strigiformes</i> — Owls	2	9	23
<i>Caprimulgiformes</i> — Frogmouths, nighthawks	1	1	16
<i>Apodiformes</i> — Swifts, hummingbirds	1	1	1
<i>Trogoniformes</i> — Trogons, quetzels	1	1	1
<i>Coraciiformes</i> — Kingfishers, hornbills, etc.	5	9	34
<i>Piciformes</i> — Barbets, toucans, woodpeckers	3	6	18
<i>Passeriformes</i> — Perching birds	23	68	254
Totals	74	281	1299+

(Only specimens owned by the New York Zoological Society are included.)

DEPARTMENT OF MAMMALOGY

When the Wolf Wood exhibit first opened at the Zoo in 1966, it was an immediate success; it gave visitors a chance to see these fascinating predators living in a natural setting without visible barriers. During 1979, a greatly enlarged version of the original display opened, with six young female wolves added to the pack. The playful antics and activity of these animals has made a visit to Wolf Wood a high point for Zoo-goers of all ages.

Among the other significant additions to the mammal collection were two lowland gorillas and a group of rare and beautiful Asian sambar deer. The gorillas, both females, are on breeding loans and join several eligible young bachelors at the Great Apes Building. The younger of the two females, six-year-old Huerfanita from Albuquerque, New Mexico, has taken up residence with the young males, Mopie and Hodari. Holoki, a mature animal from the Philadelphia Zoo, settled in nicely with the mature male, Bendera, and the two females, Tunuka, and Sukari. The sambar deer make a spectacular addition to the Rajasthan Uplands exhibit in Wild Asia, where they have already produced a fawn.

At the end of 1979, the mammal census listed more than 1,109 animals of 142 species in the collection. Of this total, 284 young animals of 58 species had been added as the result of breeding. Notable among these were many nocturnal forms reared at the World of Darkness. Fortunate visitors to the display during the year were able to catch glimpses of a black-backed duiker calf; an infant douroucouli, or owl monkey, clinging to its mother; a leopard-cat kitten; a half-dozen

sugar gliders; a flying-fox baby; and a baby lesser galago. Elsewhere in the Park, important births included three snow leopards, two Eld's deer, two Mongolian wild horses, three gaur calves, two proboscis monkeys, and a Malayan tapir.

An important curatorial research and conservation project initiated by the department in 1978 showed its first positive results. Working in Argentina with the cooperation of the Parques Nacionales Argentinas and the Fundacion Vida Silvestre Argentina, the Society initiated a captive-breeding program for the southern pudu, a small and very rare South American forest deer. During 1979, two fawns were born to a semi-captive group at Isla Victoria, in Nahuel Haupi National Park.

Construction at the Bronx Zoo continued during the year on the Large Rare Mammals Building and the Jungle Building. Scheduled for opening in 1981, the Large Rare Mammals Building has been made possible by gifts from Mr. and Mrs. James Walter Carter and will house herds of giraffes, zebras, and rare African antelope. The Jungle Building, planned to open in 1983, is the largest indoor display ever undertaken by the Society. The building will provide spacious habitat displays for proboscis monkeys, spectacled langurs, gibbons, tapirs, the spectacular Komodo "dragon," and the elusive Chinese leopard.

Plans were also underway during the year for renovating and enlarging the Sea Lion Pool on Baird Court, as well as for the creation of Baboon Highlands, a new display for gelada baboons and ibex in the African Plains complex.

MAMMAL COLLECTION, BRONX ZOO, AT DECEMBER 31, 1979

Order:	Families	Species	Specimens
<i>Marsupialia</i> — Kangaroos, phalangers, opossums	2	5	47
<i>Insectivora</i> — Moles, shrews, hedgehogs, etc.	1	1	3
<i>Chiroptera</i> — Bats	3	12	131+
<i>Primates</i> — Apes, monkeys, lemurs, marmosets, etc.	6	29	154
<i>Edentata</i> — Armadillos, sloths, anteaters	2	2	3
<i>Rodentia</i> — Squirrels, mice, porcupines, etc.	12	22	123+
<i>Carnivora</i> — Bears, raccoons, cats, dogs, otters, etc.	6	27	78
<i>Pinnipedia</i> — Seals, sea lions, etc.	2	2	4
<i>Proboscidea</i> — Elephants	2	2	8
<i>Perissodactyla</i> — Horses, tapirs, rhinoceroses	3	6	39
<i>Artiodactyla</i> — Cattle, sheep, antelopes, camels, giraffes, deer, swine, hippopotamuses	8	34	519
Totals	47	142	1109+

(Only specimens owned by the New York Zoological Society are included.)

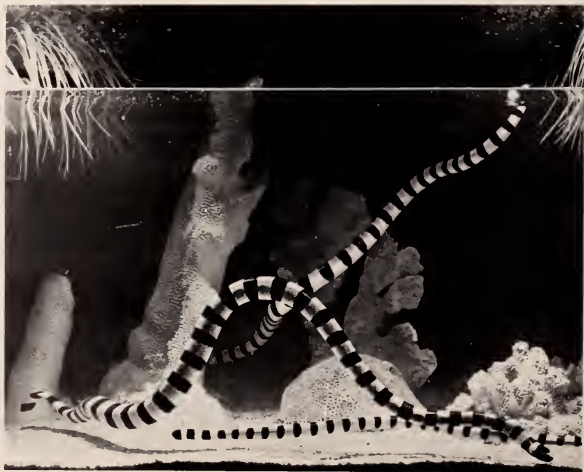
Without doubt, Tus, the Asian elephant, is the largest animal in the Zoo. As measured by Associate Curator of Mammals Mark MacNamara (at top), General Curator James G. Doherty (left), and elephant trainer Larry Joyner (right), she stands eight feet, four inches high at the shoulder and weighs 9,456 pounds.

No less impressive are the big bears, the largest land carnivores. Zoo-visitors could watch mother polar bear keep a watchful eye on her cub, Frosty, both in and out of the pool (bottom, left), or observe a large Kodiak brown bear enjoy the snowfall of winter (bottom, right).





The acquisition of animals often takes Society staff into the field. John Behler, Curator of Herpetology, collected yellow-lipped sea kraits on Toberua Island in Fiji for exhibit in the Zoo's Reptile House.



DEPARTMENT OF HERPETOLOGY

At the end of 1979, the Society's collection of reptiles and amphibians numbered 593 specimens representing 122 species. During the year, 17 forms bred at the Reptile House and produced a total of 182 offspring. Of particular interest were the hatching of 28 king cobras, an Asian elongated tortoise, and—for the seventh consecutive year—Muhlenberg's turtles.

The most exciting breeding success of the year occurred outside the boundaries of the Zoological Park at the Rockefeller Refuge in Grand Cheniere, Louisiana. The four Chinese alligators hatched there in 1979 are the result of a cooperative propagation effort initiated in 1976 between the Society, the Louisiana Wildlife and Fisheries Commission, and the National Zoo in Washington, D.C. The young alligators, rarest of all the crocodilians, were flown to New York when they were six weeks old for special care by the staff of the reptile department.

At the top of the list of the year's many interesting acquisitions was a group of yellow-lipped sea kraits, collected on a Society-led expedition sponsored by Trustee Nixon Griffis to Toberua Island in Fiji. One of these colorful sea snakes turned out to be a wild-bred female who

laid a fertile clutch of eggs, which produced five hatchlings after a four-and-one-half-month incubation period.

Also of special note among the reptiles received in 1979 was a trio of rare Aldabra tortoises: a pair on long-term loan from the Rio Grande Zoo in Albuquerque, New Mexico, and an additional female from the Burnet Park Zoo in Syracuse, New York. An enclosure on the west side of the old Elephant House was renovated as a summer exhibit for these giant turtles. They spend the winter on St. Catherine's Island, in the new facility for reptiles which also quarters the Society's breeding herd of Malagasy radiated tortoises.

At the Reptile House, the staff renovated the Rain Forest and African Viper exhibits and created new displays for Hispaniolian boas, yellow-lipped sea kraits, and water cobras.

Staff members also participated in 151 tours given to visitors, schoolchildren, and special-interest groups. In addition, a three-day course on the identification of endangered reptiles was given for regional representatives of the New York State Department of Environmental Conservation.

REPTILE AND AMPHIBIAN COLLECTION, BRONX ZOO, AT DECEMBER 31, 1979

Class:	Order:	Families	Species	Specimens
<i>Amphibia</i>	<i>Caudata</i> — Salamanders	1	3	4
	<i>Salientia</i> — Frogs, toads	5	10	27
Totals		6	13	31
Class:	Order:	Families	Species	Specimens
<i>Reptilia</i>	<i>Testudinata</i> — Turtles	8	34	160
	<i>Crocodylia</i> — Alligators, caimans, crocodiles	2	13	57
	<i>Squamata</i>			
	Suborder:			
	<i>Sauria</i> — Lizards	11	24	60
	<i>Serpentes</i> — Snakes	6	49	296
Totals		27	120	573

(Only specimens owned by the New York Zoological Society are included.)

ZOO EDUCATION DEPARTMENT

Seventy-three courses were offered by the department during 1979. Since 1978, the number of adult courses has increased 100 percent, and student hours 57 percent to 57,000. This amounts to an average of 8.9 hours of instruction per student, compared with 5.1 in 1978. The increase in student hours reflects the department's attempt to offer more multi-session programs dealing with the complex subject of wildlife conservation. Programs utilize a variety of teaching methodologies and cross disciplines as varied as social sciences, geography, mathematics, language, history, art, and culture, as well as botany, ecology, and zoology.

The department has become a leader in the zoo-education field through its innovative approach to continuing education and school-curriculum needs. Windows on Wildlife, a six-part environmental awareness program for urban fourth-, fifth-, and sixth-grade children, has become so popular with school teachers that it often has become the entire core of their life-sciences curriculum. The program, sponsored by the Charles E. Culpeper Foundation, won the American Association of Zoological Parks and Aquariums 1979 Education Award.

Another new course was a career-training program for teenagers. The one-month summer session of theoretical and practical animal management provided 135 hours of intensive training on Zoo grounds.

A model four-phase program in science instruction for the mentally retarded commenced in the spring and was a cooperative effort between the Zoo's education department and the Nassau Board of Education Cooperative Services (BOCES). Another project dealt with gifted students and was designed to expand the limited science horizons of most adolescents. This program was a cooperative effort with the southern Westchester BOCES and was such a success that other Westchester County school districts have now instituted it in their systems.

The 1979 version of Zoo Camp, an environmental day camp for eight- to twelve-year-old children, was expanded to ten one-week sessions and was fully subscribed. Parental inquiries were sufficient to allow for expansion of the idea to pre-schoolers in 1980. Zoo Safari, a two-day adventure for adults to explore the fauna and culture of zoogeographical areas featured in the Bronx Zoo's collections, was an overwhelming success.

The department staff of thirteen educators and scientists has also taught in programs outside the Zoo. Many are now adjunct lecturers at New York University and Fordham University, involved in college-level courses in animal behavior. In addition, six graduate teaching fellows each joined the staff for one semester. They received instructional guidance from the department's personnel. The funding for this project was provided by the Helena Rubinstein Foundation.

Several educational books and pamphlets were produced by the staff to meet specific needs of the department's courses. Of significance was the Wild Asia Teacher's Kit, a major curriculum supplement for biology teachers, produced with the financial aid of the Helena Rubinstein Foundation and Champion International.

The Friends of the Zoo volunteers offered guided tours, mini-talks at selected exhibits, artifact tables, and an outreach program for hospitals and homes for the aged. They reached 11,300 individuals. Both the volunteers and the department's regular staff are now offering programs seven days a week. These operations were all aided through the generosity of the Exxon Corporation and the Avon Products Foundation.

Approximately \$70,000 was contributed to the department's operating budget through tuition for courses offered to the general public. This figure represents an increase of 40 percent over 1978.

The design and construction of a new Children's Zoo occupied much of the staff's attention during 1979. Some areas have now been partially constructed, and work will continue through 1980. Partial support for this totally new concept in children's zoos has been provided by the Charles Hayden Foundation, the Kresge Foundation, and the William Randolph Hearst Foundation. Additional support is still needed to complete the \$1,255,000 project, which promises to be a model for children's zoo design throughout the country.

The present Children's Zoo continues to attract over 20 percent of the Zoo's visitors—300,000 persons in 1979. The department's elephant, camel and pony-ride operations provided an exciting and educational experience for 182,000 children and adults. In all programs and activities, 466,000 persons were reached by the Zoo's Department of Education, almost one of every three Zoo-visitors.

"Zoo Camp," a summer day camp for youngsters, has proved to be one of the most popular of the education department's courses. Participants enjoy a week of behind-the-scenes tours and a chance to be "keeper for a day" at the Children's Zoo.



CHILDREN'S ZOO COLLECTION AT DECEMBER 31, 1979

Class:	Order:	Families	Species	Specimens
Aves	<i>Ciconiiformes</i> — Herons	2	2	3
	<i>Anseriformes</i> — Ducks, geese	1	5	31
	<i>Falconiformes</i> — Falcons	2	2	4
	<i>Galliformes</i> — Chickens	2	2	6
	<i>Columbiformes</i> — Doves	1	1	1
	<i>Psittaciformes</i> — Parrots	1	10	14
	<i>Strigiformes</i> — Owls	2	3	4
	<i>Coraciiformes</i> — Hornbills	1	1	1
	<i>Piciformes</i> — Toucans	1	1	1
	<i>Passeriformes</i> — Perching birds	3	3	6
Totals		16	30	71
Class:	Order:	Families	Species	Specimens
Mammalia	<i>Edentata</i> — Armadillos	1	1	1
	<i>Lagomorpha</i> — Rabbits	1	1	8
	<i>Rodentia</i> — Mice, etc.	3	3	8
	<i>Carnivora</i> — Foxes, ferrets	1	1	2
	<i>Perissodactyla</i> — Horses	1	2	10
	<i>Artiodactyla</i> — Cattle, sheep, camels	3	4	27
Totals		10	12	56
Class:	Order:	Families	Species	Specimens
Amphibia	<i>Caudata</i> — Salamanders	1	1	3
	<i>Salientia</i> — Frogs, toads	2	2	3
Totals		3	3	6
Class:	Order:	Families	Species	Specimens
Reptilia	<i>Testudinata</i> — Turtles	2	4	5
	<i>Squamata</i>			
	<i>Suborder:</i>			
	<i>Sauria</i> — Lizards	2	2	2
	<i>Serpentes</i> — Snakes	2	5	11
Totals		6	11	18

(Only specimens owned by the New York Zoological Society are included.)

WILDLIFE SURVIVAL CENTER

The fifth anniversary of the Wildlife Survival Center on St. Catherine's Island, 1979 was an extremely productive year, high-lighted by the number of ambitious construction projects that were undertaken and completed, as well as by the many outstanding births in the animal collection. Among the improvements was a new, large combination kitchen, nursery, and office. Sorely needed, as the collection now includes a wide variety of species with complex dietary requirements, this facility is well-equipped to hatch and rear young birds and tortoises. It has space to hand-rear orphaned mammals and to maintain animal records.

In August, herds of Jackson hartebeest and slender-horned gazelles began to share a new six-acre pasture. In addition to the pasture itself, this enclosure includes a series of spacious corrals, isolation pens, and a large, open-fronted barn.

The first facilities to house reptiles at the Center were also completed during 1979. The new complex consists of a series of ten tortoise yards, with a wintering barn that has a vermin-proof room for grain storage. In July, the Society's breeding group of endangered Malagasy radiated tortoises arrived at the island and were established in this new propagation compound.

During the year there were a number of noteworthy "first-time-on-the-island" births. Among these was a Jackson hartebeest born in July. The herd on St. Catherine's Island is the only breeding group of this rare species in the United States. It was moved to the Center from the Zoological Park in 1978.

Although it failed to survive, a Pesquet parrot chick, which hatched in the Center's parrot aviaries, was a first for the species in this country. The breeding pair continues to show interest in nesting, and there is great hope for the future.

The real success of the breeding program as a whole at the Wildlife Survival Center was made even more evident this year when the first second-generation births occurred in herds of addax, gemsbok, and sable antelope.

A near-disaster struck the Center in September, when Hurricane David swept across the island with 90-mile-an-hour winds. Although it was necessary to replace and repair hundreds of feet of fencing damaged by fallen trees, the animal collection weathered the storm without loss.

The Wildlife Survival Center on St. Catherine's Island provides large pastures for herds of sable antelope (at right) and dorcas gazelle (opposite).





WILDLIFE SURVIVAL CENTER COLLECTION AT DECEMBER 31, 1979

Class:	Order:	Families	Species	Specimens
<i>Aves</i>	<i>Anseriformes</i> — Geese	1	1	12
	<i>Galliformes</i> — Quail, pheasants, etc.	1	1	2
	<i>Gruiformes</i> — Cranes	2	6	24
	<i>Psittaciformes</i> — Parrots	1	5	14
<i>Totals</i>		5	13	52
Class:	Order:	Families	Species	Specimens
<i>Mammalia</i>	<i>Marsupialia</i> — Kangaroos	1	1	6
	<i>Perissodactyla</i> — Horses, tapirs, rhinoceroses	1	1	6
	<i>Artiodactyla</i> — Antelopes	1	6	84
<i>Totals</i>		3	8	96
Class:	Order:	Families	Species	Specimens
<i>Reptilia</i>	<i>Testudinata</i>	1	1	16
<i>Totals</i>		1	1	16

(Only specimens owned by the New York Zoological Society are included.)

NEW YORK AQUARIUM



Leopard sharks were among the first occupants of the new shark tank at the Aquarium. This unique exhibit gives visitors a close-up view of these most feared—and most fascinating—fishes.



"Jaws" notwithstanding, sharks are beautiful! Their beauty lies not only in their majestic display of strength, but also in the important role that they play in the economy of the sea. They are the predators *par excellence* in the aquatic environment. These magnificent creatures appeared 100 million years before dinosaurs held sway over the air, sea, and landscapes and 150 million years before the first mammals suckled its young. Sharks persist till this day in even greater varieties, and a unique exhibit has been designed for them at the New York Aquarium. It will be opened formally to the public in spring 1980.

Three large acrylic panels, two of which are tilted, provide the visitor with a tri-faceted view of sharks. This is the very first time that tilted viewing panels have been used in an aquarium exhibit. This display highlights the fact that certain sharks are bottom-dwellers, some are mid-water swimmers, and others roam the surface waters. Leopard, lemon, black-tip, and nurse sharks are already at home in this exhibit and many other species will cohabit with them soon. This exciting new facility was made possible by the generosity of the Cordelia Scaife May Charitable Trust, the Vincent Astor Foundation, the Barker Welfare Foundation,

and the Natural Heritage Trust of New York State. It will be dedicated to the memory of George F. Baker, Jr.

A number of smaller new exhibits have been opened during 1979. Diminutive, strangely beautiful grunt sculpins from the Pacific Northwest quickly found a home, deposited eggs, guarded them, and watched them hatch. Our clownfish also produced many young. These colorful creatures deposit their eggs on coral surfaces, and both parents actively keep them clean, aerated, and free of predators. Scuba divers and snorkelers have always been enchanted by living coral. A specially designed exhibit has featured several species of coral which have been maintained alive for more than nine months. And the New York Aquarium has kept chambered nautilus alive longer (two years) than any other aquarium.

After the dolphins left for their winter sojourn in Florida, two of the white whales were trained to perform for the public. Although whale leaps are not as graceful nor as high as those of the dolphins, the movements of these massive animals delight our cold-weather visitors.

AQUARIUM EDUCATION DEPARTMENT

The education department of the New York Aquarium continued in 1979 to provide marine-education services for teachers and metropolitan-area students. Teacher workshops conducted between January and October drew 408 educators at the elementary and secondary levels. Seven programs were offered for students at the elementary level, reaching more than 3,000 children. At the junior-high and high-school levels, the Aquarium conducted eight different programs for 1,372 students.

Because aquatic collections are generally silent and enclosed, they require that Aquarium educators develop special interpretive techniques and programs that help people understand life in a water environment. A variety of materials were developed for these programs and tested with the cooperation of New York City School District 22. Teachers, students, and supervisors evaluated pre-trip and post-trip materials, language-arts materials, seafood cookery, nutritional and anatomical materials, and guides to the collections.

In 1979, the Aquarium initiated new programs including: the Children's Corner (for pre-schoolers), winter camp, seafood cookery for adults, and behind-the-scenes tours of the Osborn Laboratories. Weekend programs for adults and families were expanded. Activities included lecture series for each audience, behind-the-scenes tours, and afternoon film series.

Family workshops serve a two-fold purpose: to teach participants about the biological concepts of adaptation and environment, and to teach families a conscious method for learning together. The course begins with a discussion from an anthropological point of view of family interactions, illustrating ways family members learn from each other. Activities such as role-playing, games, crafts, and discussions encourage families to apply learning techniques to the study of marine biology. Developed in conjunction with educators at Southern Methodist University and Columbia University, this program represents a significant new approach to a particularly important type of learning that cannot be addressed easily in traditional classroom settings.

Another new approach was tested this year in the area of marine education for teenagers. An advanced-level summer-camp curriculum was designed for high-school students pursuing marine-science studies. Through laboratory work, field trips to various aquatic habitats, and a collecting expedition on a marine-research vessel, students learned how to employ the proper techniques and equipment for capturing, transporting, and maintaining aquatic plants and animals. Students learned a range of techniques, from shipboard analysis of marine water and specimens to laboratory procedures in dissection, classification, and identification.

NEW YORK AQUARIUM COLLECTION AT DECEMBER 31, 1979

Phylum:	Class:	Order:	Species	Specimens
Chordata	Chondrichthyes — Sharks, rays and chimeras	Heterodontiformes — Horn shark	1	2
		Galeomorpha — Typical sharks	8	35
		Rajiformes — Rays	2	3
	Osteichthyes — Bony fishes	Holostei — Gars, bowfin	3	16
		Elopiiformes — Tarpon, bonefish	1	3
		Anguilliformes — Eels, morays	3	3
		Salmoniformes — Trouts	2	2
		Cypriniformes — Minnows, carp, cavefishes	11	485
		Siluriformes — Freshwater catfishes	5	19
		Cyprinodontiformes — Platy, swordtails, killifish	6	283
		Batrachoidiformes — Toadfishes	2	11
		Gadiformes — Codfishes	1	2
		Beryciformes — Squirrelfishes	4	39
		Gasterosteiformes — Seahorses, pipefish	1	21
		Perciformes — Perches, sea basses	135	520
		Pleuronectiformes — Flatfishes	5	32
		Tetraodontiformes — Puffers, boxfish, triggerfish	3	32
		Superorder:		
		Ceratodimorpha — Lungfishes		
		Family:		
		Ceratodidae — Australian lungfish	1	1
		Protopteridae — African lungfish	1	1
Amphibia		Urodela — Salamanders	1	6
		Anura — Frogs	1	20
Reptilia		Chelonina — Turtles	8	21
Aves		Sphenisciformes — Penguins	2	23
		Anseriformes — Ducks	1	7
Mammalia		Pinnipedia — Seals, sea lions	4	14
		Cetacea — Whales, dolphins	2	7
Coelenterata	Anthozoa — Corals and anemones		28	12,000 +
Annelida	Polychaeta — Marine worms		1	10
Arthropoda	Crustacea — Lobsters, shrimps, crabs, etc.		14	22
	Arachnida — Horseshoe crab		1	17
Mollusca	Gastropoda — Snails		4	170
	Pelecypoda — Bi-Valves		2	6
	Cephalopoda — Octopus, nautilus		2	9
Echinodermata	Asteroidea — Starfish		10	120
	Holothuroidea — Sea cucumbers		2	13
	Echinoidea — Sea urchins		3	125
Totals:			281	14,100 +

OSBORN LABORATORIES OF MARINE SCIENCES

A well-balanced diet is essential if young fish are to develop normally. Dr. Paul J. Cheung has shown that newly hatched killifish raised exclusively on a commercially available, artificial diet develop spinal deformities. Dr. Cheung was able to prevent skeletal deformations by supplementing the diet with ascorbic acid (vitamin C).

Recent studies by Dr. Klaus D. Kallman have focused upon the genetic factors that influence the onset of sexual maturity in the platyfish, *Xiphophorus maculatus*. Some fish appear to become sexually mature when they reach a certain size; others when they reach a certain age. Dr. Kallman's studies indicate that both elements (size and age) are operative and that the onset of sexual maturation can be delayed by exercising strict control over the diet of the fish.

Certain species of fishes in the Aquarium collection provided some novel information. The lanternfish, creatures of the dark, venture toward the surface only on nights when even the moon sheds no light. These spectacular fish possess an array of light-producing bacteria under each eye, and they use their subocular beams to find food and to locate the opposite sex.

They occasionally shut off their light by pulling a curtain over it while quickly changing direction to elude predators. Dr. Peter Burn has found that these fish harbor five different parasitic worms, none of which had ever been described.

Dr. Kenneth Gold's studies on the formation of concretions in the kidneys of the chambered nautilus now include an analysis of this phenomenon in the common edible clam. This research is designed to compare the deposition of this material in the kidneys of clams in unpolluted versus polluted waters.

Dr. Hao H. Sun, natural products chemist, joined our staff from Scripps Institute of Oceanography. He will analyze the chemical constituents of a variety of marine organisms. Sea creatures, because of their long and successful evolutionary history, are a good source for new drugs. This research is supported by a grant from the Whitehall Foundation.

The three Jessie Smith Noyes post-doctoral fellows have made significant progress in demonstrating the importance of genetic selection, efficient food chains, and disease processes in the success of aquacultural endeavors.

The Osborn Laboratories is dedicated to basic research in the aquatic sciences. Its association with the New York Aquarium has led to many interesting and significant discoveries.



ANIMAL RESEARCH AND

Dr. Thomas Struhsaker continues his long-term study of the Kibale Forest in Uganda which has resulted in an unprecedented amount of data on rainforest primates.



Lysa Leland



The Society's Center for Field Biology and Department of Conservation were combined into one unit in 1979, and new guidelines and goals were established for its future.

Historically, the Society has furthered its conservation and research efforts in two ways: by using its own full-time field investigators and by funding the research projects of others. Since 1966, the Society has employed a major staff of scientists to conduct long-term research—the only non-governmental organization to do so. Each of these zoologists has a scientific specialty in which he or she has not only become a recognized expert, but is also capable of offering a total program, from basic research to educational efforts at preserving a given area in perpetuity. At the same time, the Society provides research and education funds to other projects; in 1979, grants were given to twenty new projects of this kind in fourteen countries. For a quarter of a century, the Society has funded dozens of outside projects, and much of what is now known about the behavior of animals is based on them.

Because the world's conservation needs are so great, while time, funds, and staff are always limited, the Society has again realigned its priorities in order to make the most effective use of its resources. Outside projects will still be funded, but the emphasis will now be placed on preserving and managing those deteriorating ecosystems in which staff zoologists have special interest and knowledge. These projects can be summarized as follows:

Dr. David Western and his co-workers have studied the Amboseli area in Kenya since 1967. His project has not only provided basic data on the dynamics of a savannah ecosystem, but also shown how the conflicting needs of pastoralists and wild animals can be reconciled. Based on the broad knowledge gained from his Amboseli work, Western served as head of Kenya's Wildlife Planning Unit and prepared a five-year development plan for Kenya's wildlife. He now intends to expand his research to other parts of Africa and the world to find the answers to such basic questions as: How variable are savannah ecosystems? How sensitive are they to human impact?

Dr. Roger Payne, in collaboration with his wife Katharine, has been involved with whales for over a dozen years, gathering information on the endangered right whales and humpback whales and, through films, lectures, and records, creating public awareness of these inspiring animals. Their efforts have already resulted in the establishment of two reserves: one on the coast of Argentina, for the southern right whale, and another in the waters around Maui, Hawaii, for humpback whales.

Dr. Thomas Struhsaker has studied primates and other animals in the Kibale rain forest of Uganda, for the last ten years. His research on such topics as monkey socioecology, the effect of selective logging on rodent

populations, and phyto-chemistry of animal food plants have greatly enhanced our understanding of rain forests as the most complex of terrestrial ecosystems. The long-term plan is to make the Kibale a model of integrated research, conservation, and education for tropical rain forests.

Rather than concentrate on a single area, Dr. George Schaller has been studying a series of unique habitats that, although rich in wildlife, have remained little known biologically. After finishing a project in the Himalaya Mountains, Schaller moved to the Pantanal, a vast swampy region in southwestern Brazil. There his research focuses on the endangered jaguars and marsh deer—as well as on caiman and capybara, two species which could be harvested commercially for their meat and hides, thereby contributing to the economy of the area while preserving the habitat.

In conservation there are always crises, and to these situations the Society responds with immediate action. For instance, in recent years the rhinoceros has been so heavily poached for its horns throughout Africa that the decline in some populations has been over 80 percent. With an initial grant from the Society and in collaboration with the World Wildlife Fund, Alison K.K. Hillman began a program to determine the extent of the trade in horns and to design protective measures. Still another emergency arose after the ouster of Idi Amin, when troops entered the national parks in Uganda and shot the wildlife. The Society sent R.C. Malpas to determine the effect of this carnage on the animal populations and to assist the government in re-establishing itself in the parks.

The Society prefers, however, to prevent potential crises, not just to react to them. It is constantly looking for opportunities where its efforts may help preserve species and their habitats. The potential of two new projects of this type is particularly exciting. One concerns the recent discovery of migratory antelope herds in the southern Sudan that rival those of the Serengeti in numbers. The Society is initiating projects there to census and to study such species as white-eared kob and giant eland, and also to advise the government on the establishment and management of national parks. The work will be supervised by Dr. Western and carried out by A.R.E. Sinclair and John Fryxell.

The second project concerns China, an area that has remained closed to outside field biologists for forty years. The World Wildlife Fund has recently established a joint conservation committee with China and asked George Schaller to initiate a collaborative research program with his Chinese counterparts. The potential for a joint research and conservation effort is particularly exciting, with an initial study of the giant panda, and possible later ones of such animals as the takin and the Manchurian tiger and of the unique fauna of the Tibetan uplands.

The ultimate goal in conservation is to save "pieces of nature." Over the years the Society has helped in the establishment of more than forty reserves: in 1979 it contributed to three new ones. Punta Tombo, on the coast of Argentina, is one of these. Funds were given to the provincial government by the Society and the Frankfurt Zoological Society to build a guard post, protecting the reserve. General Director William Conway was present at the inauguration ceremony, which was also attended by the provincial governor.

In Brazil, the establishment of the five-million-acre Pico da Neblina National Park was the direct result of a survey of potential sites in the Amazon basin made by Dr. Schaller several years ago. Also in Brazil, the government bought the first 175,000 acres of the future half-million-acre Pantanal National Park after a Society-sponsored project helped to survey and demarcate the area.

Research represents only the first step in solving ecological problems. Education is also an essential component of any such program. During 1979, the Society sponsored a conservation education project in Sri Lanka and also supported an international conference on sea turtles, held in Washington, D.C.

In another approach to a conservation problem, the Society sent an investigative reporter to Africa and Europe to determine the extent of the trade in elephant ivory and in rhinoceros horn, for a special issue of *Animal Kingdom* magazine to be published in February 1980. The publication will be distributed to the members of the U.S. Congress and to many conservation organizations.

Whatever its immediate goals, the Society continues to emphasize exploration into new areas—new countries, new techniques, new ideas—always striving to make conservation as effective as possible.

FIELD PROJECTS AROUND THE WORLD



Location	Project	Investigator
1 USA	Social behavior of captive snow leopards	Helen Freeman
2 USA	Trade Records Analysis of Fauna & Flora in Commerce (T.R.A.F.F.I.C.)	Nicole Duplaix
3 USA	Report on game ranching	Alexandra Dixon
4 Bermuda	Conservation of the cahow & other wildlife	David Wingate
5 Bahamas	Conservation & biology of the hutia	Garrett Clough
6 Caribbean	Evolutionary rates & host defenses against the shiny cowbird	Alexander Cruz
7 Mexico	Partial support for field studies of thirteen pupfish species to implement a preservation program	Robert Miller

8	Honduras	Ecological survey & management of the rainforest park	Jeffery Froehlich
9	Costa Rica	Ecology & behavioral study of the tapir	Keith Williams
10	Peru	Consultant on endangered species	Antonio Brack-Egg
11	Brazil	Conservation studies of jaguar, marsh deer, capybara & caiman	George Schaller & Howard Quigley
12	Brazil	Ecology of the maned wolf	James Dietz
13	Argentina	Development of Los Escarchados Wildlife Reserve	
14	Sierra Leone	Regional survey of chimpanzee populations	Geza Teleki
15	Cameroun	Facilitation of the establishment of four national forests & a lowland gorilla sanctuary	J. Stephen Gartlan
16	Angola	Survey of the giant sable antelope	Richard Estes
17	Zambia	Habitat/elephant management & communal-species research in Luangwa Valley	Dale Lewis
18	Zimbabwe	Ecology of the Nile crocodile	Jonathan Hutton
19	South Africa	Bird/human interaction in the Cape vulture	Joan Calre Dobbs
20	Sudan	Wildlife research in southern Sudan	John Fryxell & A.R.E. Sinclair
21	Sudan	Study of the bongo & giant eland	Chris Hillman
22	Uganda	Study of the five primate species in Kibale Forest	Thomas Struhsaker
23	Uganda	Status of wildlife in Uganda's national parks	Robert C. Malpas
24	Kenya	Ecology of Amboseli National Park	David Western
25	Kenya	Conservation of the African rhinoceros	Alison K. K. Hillman
26	Kenya	Behavior of elephants in Amboseli National Park	Cynthia Moss
27	Kenya	Ecological status of indigenous forests	A. Diamond & F. Owino
28	Kenya	Investigation of the behavioral ecology of the male elephant in Amboseli	Joyce Poole
29	Tanzania	Census of wildebeest and other Serengeti wildlife	A.R.E. Sinclair
30	Tanzania	Survey of primary forest distribution	W.A. Rogers & K.M. Homewood
31	India	Ecology and behavior of Nilgiri tahr	Clifford Rice
32	Sri Lanka	Promotion of conservation education	Rudy Rudran
33	Bangladesh	Survey of distribution of Asian elephant populations	Mohammed A.K. Khan
34	Thailand	Behavior & conservation of the pileated gibbon	Warren Brockelman & S. Srikosarmatora
35	Thailand	Development of a research & training program at Huay Khaeng Game Sanctuary	Ardith Eudey
36	Fiji	Status and conservation of an endangered <i>Brachylophus</i> inguana in the Fiji region	John Gibbons



Rejected by his mother at birth, a cotton-top marmoset, named Marmaduke, was hand-reared by Dr. Janet Stover at the Animal Hospital until he was old enough to join others of his species at the Monkey House.



An enormous polar bear engaged in play in an icy pool and a minute hummingbird feeding in a tropical forest in the World of Birds seem impossibly different to a Zoo-visitor. These same animals, however, may exhibit identical disease conditions, and in 1979 the preventive medical programs for both species became remarkably similar. This expansion of our disease-monitoring capabilities came as a result of staff changes that have vastly improved our diagnostic and recording abilities.

The Children's Zoo area was involved in two epidemics during 1979. Contagious ecthyma began in several sheep during the late summer and spread to various goats and sheep. A vaccination program coupled with a quarantine of the Children's Zoo was effective in eliminating this disease. Late in the fall a fungal infection was diagnosed in the riding camels; it proved responsive to prolonged treatment. Both of these diseases are thought to have originated from visitors, as no new animals had been introduced to this area for over three months.

Two new projects helped to increase our awareness of problems in young animals. Dr. Christine Sheppard of the Department of Ornithology initiated a project that attempted to determine the causes of poor hatchability and disease in new chicks. Preliminary results suggest a nutritional or genetic cause for many problems in hatching and a bacterial etiology for most chick diseases. A continuation of this study in 1980 will survey changes in causes of

mortality following appropriate changes in diet, breeding, and sanitation.

The second study involves the development of a rapid test to determine if a newborn mammal has nursed, therefore, receiving gamma-globulin. The results were very consistent and indicate that we can determine if a newborn has suckled, thus providing an additional tool for the evaluation of newborn mammals.

Dr. Janet Stover, a graduate of the University of Pennsylvania Veterinary College in 1976, joined the medical staff in July to pursue a career in zoological medicine. Dr. Stover has postgraduate training in pathology, completed a residency in reproductive physiology, and practiced veterinary medicine at the Philadelphia Zoo. The Department of Animal Health anticipates new studies on reproductive methods, including artificial insemination and semen storage, during Dr. Stover's tenure at the Zoo.

Animal-food costs continue to increase rapidly due to inflation in the national economy. Cooperative efforts with the purchasing department were instituted to survey other sources and types of food materials to reduce our purchase costs. George Fielding, the animal commissary manager, has also streamlined the food-delivery system to reduce costs. It is imperative that food quality be maintained at its present high level while attempting to maintain present costs.

Behler, John L. Operation sea snakes. *Animal Kingdom* 82(6):N2-N3.

———. The Audubon Society field guide to North American reptiles and amphibians (with F. Wayne King). Alfred A. Knopf, New York. 719 pages.

Bell, Joseph. Breeding the Malayan wreath-billed hornbill at the New York Zoological Park (with Donald F. Bruning). *International Zoo Yearbook* 19:33-35.

Besch, Deborah. Vanishing species, Florida Everglades kite. *Animal Kingdom* 82(2):35.

———. Vanishing species, quokka. *Animal Kingdom* 82(1):35.

Borowsky, Betty. The nature of aggregation of *Nassarius obsoletus* in the intertidal zone before fall offshore migration. *Malacological Review*:12.

Brazaitis, Peter. Denizens of a secret underworld. *Animal Kingdom* 82(6):14-18.

Bruning, Donald F. The need for long-term propagation efforts by zoos and aviculturists. *American Pheasant and Waterfowl Society Magazine* 79(2):8-13.

———. Indian pigmy goose raised at the New York Zoo with an update on their torrent ducks. *Game Bird Breeder's, Aviculturists', Zoologist's, and Conservationist's Gazette* 28:5.

Cheung, Paul J. Studies on cryptocaryoniasis in marine fish: effect of temperature and salinity on the reproductive cycle of *Cryptocaryon irritans* Brown, 1951 (with Ross F. Nigrelli and George D. Ruggieri). *Journal of Fish Disease* 2:93-97.

———. *Parauronema* as a marine facultative parasite (with Ross F. Nigrelli and George D. Ruggieri). Abstract, 35th Northeastern Fish and Wildlife Conference, Providence, Rhode Island. April.

———. Fish as models for hemosiderosis (with Ross F. Nigrelli, George D. Ruggieri, Kenneth Gold, and J. C. Baiardi). Abstract, 4th Cooley's Anemia Symposium, New York. May.

———. Effects of temperature, salinity, and pH in endozootics of protozoan diseases in captive fishes (with Ross F. Nigrelli and George D. Ruggieri). Abstract, Wildlife Disease Association Conference, Norman, Oklahoma. August.

———. Coccidian parasite of black fish, *Tautoga onitis* (L): life cycle and histopathology (with Ross F. Nigrelli and George D. Ruggieri). Abstract, Annual Meeting of the American Society of Zoologists, Tampa, Florida. December.

Colon-Urban, Rita. Observations on the development and maintenance of *Octolasmis aymonini* gerionophila (with Paul J. Cheung, George D. Ruggieri, and Ross F. Nigrelli). *International Journal of Invertebrate Reproduction* 1:245-252.

Conway, William. Zoo surplus and exotic game ranches. A special report for the American Association of Zoological Parks and Aquariums, Wheeling, West Virginia. 52 pages.

———. An undertaking for zoo curators: ISIS, analysis, and animal management. 55th Annual Conference, American Association of Zoological Parks and Aquariums, St. Louis, Missouri. September.

———. The scientific justification of studbooks. *International Studbook Symposium*, Copenhagen, Denmark. October.

———. Where do we go from here? III International Symposium on Breeding Endangered Species in Captivity, San Diego, California. November.

Dingerkus, Guido. Chordate cytogenetic studies: an analysis of their phylogenetic implications with particular reference to fishes and the living coelacanth. *Occasional Papers of the California Academy of Sciences* 134:111-127.

Doherty, James G. Animal management in "Wild Asia." 55th Annual Conference, American Association of Zoological Parks and Aquariums, St. Louis, Missouri. September.

Gold, Kenneth. Scanning electron microscopy of *Tintinnopsis parva*: studies on particle accumulation and the striae. *Journal of Protozoology* 26(3):415-419.

———. The ultrastructure of *Tintinnopsis parva* (with M. Laval-Peuto and E. R. Storn). *Transactions of the American Microscopical Society* 98(2):204-212.

———. Studies on Tintinnina using the scanning electron microscope. Abstract, New York Microscopy Society Meeting. May.

Hensel, Karen A. Aquariums and marine educators: where do we go from here?; past, present, and future of aquariums as educative institutions. *Current, Journal of Marine Education* 1(1):10-14.

———. National survey of educational programming in zoos and aquariums. 55th Annual Conference, American Association of Zoological Parks and Aquariums, St. Louis, Missouri. September.

Kallman, Klaus D. Genetic dissection of the process of sexual maturation. Abstract, Annual Meeting of the American Society of Ichthyologists and Herpetologists, Orono, Maine. July.

———. Is sterility in *Xiphophorus* hybrids due to a genetically controlled malfunctioning of the hypothalamus? (with Isaac Bao). Abstract, Annual Meeting of the American Society of Ichthyologists and Herpetologists, Orono, Maine. July.

Napolitano, Raymond L. Reptilian amoebiasis (with Emil P. Dolensek and John L. Behler). *International Zoo Yearbook* 19:126-131.

Payne, Roger S. Humpbacks: their mysterious songs. *National Geographic* 155(1):18-25.

———. Voices in the sea: communication among whales. 16th Paul Errington Memorial Lecture, Ames, Iowa.

Ruggieri, George D. Drugs from the sea. *Mada-Hebrew Science Journal* 22(3-4):165-169.

_____. The secret world of the octopus (with Norman D. Rosenberg), pages 62-65. *In* Ranger Rick's Surprise Book, National Wildlife Federation, Washington, D.C.

_____. Encomium to Dr. Ross F. Nigrelli. Proceedings, National Microscopical Congress and American Society of Microscopists, Centennial Meeting:29.

Schaller, George B. Between two worlds. *Animal Kingdom* 82(2):4-21.

_____. Ecology and behavior of high-altitude mammals in South Asia, pages 461-478. *In* National Geographic Society Research Reports, Washington, D.C.

Struhsaker, Thomas T. Phenolic content of vegetation in two African rain forests: ecological implications (with D. McKey, P. G. Waterman, C. N. Mbi, and J. S. Gartlan). *Science* 202:61-64.

_____. Kibale: an inheritance still preserved (with Lysa Leland). *Swara* 2(1):18-24.

_____. Socioecology of five sympatric monkey species in the Kibale Forest, Uganda (with Lysa Leland), pages 159-228. *In* *Advances in the Study of Behavior*, Volume 9, Academic Press, New York.

Van Haasteren, Joan. Profile Roger Payne. 3-2-1 Contact 1:10-11.

Walter, Eugene J., Jr. Why do they do what they do? *International Wildlife* 9(5):18-37.

Western, David. Size, life history, and ecology in mammals. *African Journal of Ecology* 17(4).

_____. Environmental aspects of settlement-site decisions among pastoral Maasai (with T. Dunne). *Human Ecology* 7(1):75-98.

_____. New perspectives in vertebrate paleoecology from a recent bone assemblage (with K. Behrensmeier and D. Dechant). *Paleobiology* 5(1):12-21.

_____. The environment and ecology of pastoralists in arid savannahs. *In* *The Future Hunter-gatherers and Nomadic Pastoral Societies in Africa* (ed. by J. Swift), International African Institute London.

_____. Measuring the distribution of animals in relation to their environment: a handbook on techniques currently used in African wildlife ecology. African Wildlife Leadership Foundation, Nairobi, Kenya. 64 pages.

EXHIBITION AND GRAPHIC ARTS

One of the basic functions of the Department of Exhibition and Graphic Arts is to aid in the development of designs for exhibits that cover all of the aspects of animal needs and visitor comfort, while stressing themes of environmental education and wildlife conservation. In 1979, one such project was the enlargement and improvement of the popular Wolf Wood display. In addition to increasing the animal capacity of the area, a rustic visitor's walk was designed and constructed with appropriate plantings, benches, and shelters for protection against sun or rain. A series of graphic presentations enhance the setting and explain some of the finer points of wolf biology.

A design was also completed for a very special nursery at the World of Birds, where visitors can see some of the great variety of nestlings that are hand-reared in the Zoo each year and witness the delicate procedures involved in their care.

Among the other exhibit projects worked on during the year were a new aquatic reptile and amphibian section at the Reptile House, the new Children's Zoo, and a spectacular new shark tank at the Aquarium. Preliminary plans were initiated for the new Baboon Highlands exhibit, the Wild Asia Jungle Building, and the Harry De Jur Aviary for waterbirds.

The department was also responsible for the design and production of the Society's Annual Report, invitations and programs for special events, summer and winter tour maps, various fund-raising materials, and course catalogues for the education departments at the Zoo and Aquarium.

The exhibit-production division was kept busy repairing and refurbishing exhibits throughout the Zoo. One interesting project was the construction of a concrete and fiberglass tree which automatically provides treats for the elephants in the Khao Yai exhibit in Wild Asia.

Models of the new Children's Zoo and sketches for both Zoo and Aquarium projects fill the graphics studio, as Robert Kosturak (at right, foreground), Curator of Exhibition and Graphic Arts, confers with Senior Exhibits Designer Dorothy Schuster.



PERSONNEL

To accomplish its diverse goals, the New York Zoological Society employed a total of 770 persons in 1979, 290 of whom were full-time scientists, curators, educators, keepers, administrators, writers, editors, designers, and fund-raisers, as well as maintenance, security, and construction personnel. In seasonal jobs having to do with visitor services, the Society employed another 480 persons, many of whom are young men and women from the Bronx or Brooklyn. The Zoo remains the employer of more young people than any other Bronx organization.

During the year the department managed negotiations with the Society's labor unions for a three-year contract, completed a trust document for the Union Health and Welfare

Plan, purchased a new medical plan, and kept various governmental agencies apprised of Society policy. Fifty-seven individuals were placed in full-time positions ranging from electron microscopist to attendant guard.

The department continued its participation in a variety of programs to provide meaningful employment to disadvantaged individuals while helping to meet the Society's staffing needs. Individuals were employed under the Comprehensive Employment and Training Act (CETA), the Urban Corps, Title X Aging Program, Youth Employment and Training Program, and CAPTURE, the Society's program with Columbus High School for handicapped youths.

VISITOR SERVICES

Food & Souvenirs

This was a year of refinement in food facilities. A modernization program of food-service stands was completed and the final four units were completely rebuilt. Emphasis was placed on orientation and training of temporary employees, and this, coupled with new uniforms, resulted in a much-improved customer experience.

The Society's souvenir program continued in its pattern of growth and improvement. New techniques in product selection, purchasing, and merchandising resulted in increased revenues.

Admissions

The group-sales program, established in 1978, continued to show substantial growth during the past year. In all, group-sales receipts increased by 28 percent. The "Zoo Pass" complete-admission ticket program grew in public acceptability, with 2.5 percent of Zoo-visitors utilizing this discount program.

Both the Bengali Express monorail and Safari Tour trains showed increases in ridership from 1978. Six new tractor trains for the Safari Tour program have been ordered for 1980.

OPERATIONS

The on-going construction program in the Zoo was quite evident during 1979. At the sites for the Jungle Building and Large Rare Mammals Building, large equipment and many tradesmen were at work throughout the year. The renovation of the 1899 Flying Cage was started during the spring and will be completed in 1981. Ground was broken in the fall for the new Children's Zoo, which will more than double its present size.

New York City is providing capital budget funds for six projects: the Sea Lion Pool renovation, the northwest-area sanitary sewer, the Baird Court building restoration, energy conservation, emergency generators, and access by the handicapped to Zoo facilities. The Zoo is funding the architect and consultant fees for these projects.

The new Wolf Wood exhibit, undertaken with the support of the Barker Welfare

Foundation, more than doubled the area for the Zoo's collection of wolves. An outdoor tortoise exhibit was built, just west of the old Elephant House. Other projects completed were a muntjac shelter in Wild Asia, a greenhouse for the World of Birds, additional crane yards and shelters, and an archives storage room for the preservation of important Society historical documents and records. This latter project was completed with the support of the H.W. Wilson Foundation.

During 1979, the maintenance department removed two large specimen trees that had died: the 75-year-old elm by the Ostrich House, and the more than 200-year-old oak by the Zoo Pub. Part of the oak tree will be used as a bridge in the new Children's Zoo. Maintenance also cleared thirty-seven trees that were felled by Hurricane David. A program of replacing specimen trees has been initiated.



Media star of the year was Marissa, a female snow leopard cub. Smaller than her male siblings, she was separated from her family temporarily for hand-rearing. Since mother was unable to clean the cub, Mammal Superintendent Fred Sterling took on that task. Photographs of Marissa's weekly wash, blow dry, and comb out were featured in newspapers and magazines coast to coast.





The circulation of *Animal Kingdom* was almost at the 100,000 mark by the end of the year and is expected to exceed that number with the first issue of 1980. Much of this increase was in the number of general subscribers, which grew from about 6,000 the previous year to nearly 22,000 in 1979. With the addition of the John Ball Zoological Society (Grand Rapids, Michigan) and the Riverbanks Zoological Society (Columbia, South Carolina), the magazine was being published for nineteen zoological societies across the country by year's end.

Editorial highlights included special issues on California, Sri Lanka, and the American prairie. An article in the California issue, comparing the early development of human and ape babies, was picked up as a news feature by *The New York Times*, *Chicago Tribune*, *San Francisco Chronicle*, and other leading newspapers and magazines. The December issue featured an eyewitness account of the slaughter of wildlife in Uganda, the first significant report on this tragedy to be published in the United States.

The photo-services section of the department continued to supply photographs for publicity and *Animal Kingdom*, as well as for other departments. A special assignment was a series of aerial photographs of the Zoo, which already has been used extensively for various purposes. As a result of the increased use of slide presentations, the Society's slide collection doubled in size.

A selection of photographs—both historical and contemporary—was provided for the 1980 engagement book published by the Women's Committee for their fund-raising event, and many new photographs of the collections were taken for the new Zoo and Aquarium guidebook which will be published next year.

Grants from Con Edison and the New York State Council on the Arts enabled the public relations department to stage a program of special summer events in honor of the Zoo's eightieth birthday.

The pelican roundup proved to be as popular a media event as ever. Other favorites at the Zoo included the concave-casqued hornbill chick, the baby gorilla, the new bird show, and Frosty, the polar bear cub, who entertained the press both at her public debut in April and at her first birthday party in chilly November. Another celebrity was Amy Lou, the Aquarium's white whale, who shared press honors this year with the new sea-lion show. There were also a number of feature stories on the Aquarium and the Osborn Laboratories, as well as some advance publicity on the new shark tank, which will open officially in 1980.

Zoo and Aquarium articles appeared in many publications, from *New York* and the *New Yorker* to *Soho Weekly News* and *News of the Highlands*; from the travel section of *The New York Times* to the cover of the *New York Sunday News Magazine*; from the *Reader's Digest* to *Cosmopolitan* to the *Electric Company Magazine*. Staff members made personal appearances on shows ranging from "AM New York" (WABC-TV) in the morning to late-night "The Fitzgeralds at Home" (WOR Radio). Several sequences were also filmed at the Zoo for the Children's Television Workshop's new science program, "3-2-1 Contact," which will be shown on public television during 1980. But the story of the year was a series of pictures, taken by the Society's photographers, of a snow leopard cub, Marissa, being bathed by Mammal Supervisor Fred Sterling; it appeared in hundreds of newspapers across the country.



Members of the New York Zoological Society are a dedicated group. When the call went out for volunteers to help clean up Wild Asia for its annual spring opening, hundreds of members arrived to rake up debris and to paint new fencing.



The Departments of Development and Membership are responsible for coordinating Society-wide efforts to generate support from the private sector and the Federal government. In the fiscal year ended December 31, 1979, the New York Zoological Society received contributions, pledges, membership dues, bequests, and new Federal support totaling \$5,400,000. This total breaks down between contributions and bequests for operating and capital purposes of \$3,100,000, including membership dues, and contributions for the Animal Kingdom Fund and endowment totaling \$2,300,000. The latter figure includes a \$500,000 challenge grant made to the Society's Animal Kingdom Fund by the National Endowment for the Arts.

In 1979 contributions and bequests for current purposes were received from individuals in the amount of \$1,220,541, from foundations in the amount of \$1,014,517, and from corporations in the amount of \$300,329. For the Animal Kingdom Fund, contributions were also received from individuals—\$135,895; from foundations—\$1,453,520; and from corporations—\$173,000; as well as from the Federal government—\$500,000. All private donors of \$1,000 or more are listed in the back of this report. It is noteworthy that in 1979 gifts of \$1,000 or more were received from 268 donors. This is a 16 percent increase over 1978.

Membership enrollment stood at 13,200 by the end of the year, an increase of 9 percent over enrollment at December 31, 1978. A total of 4,000 new members was acquired, and income from membership dues alone amounted to \$405,000, an increase of 11 percent over 1978. For the second consecutive year, over 10 percent of the Society's members were enrolled

in categories costing \$100 or more. The staff's constant effort to increase enrollment was abetted by Con Edison's insertion of three million membership brochures in its September bills to New York City and Westchester County householders. The membership staff conceived and operated eleven special events at the Zoo, at the Aquarium, and in Manhattan for members and their families. The annual meeting, on February 13, was attended by 3,500 persons.

In addition, development staff managed twenty special events and briefing sessions for donors and prospects. These events reinforced the various campaigns discussed in the Report of the President.

A major priority during 1979 was to research Federal support available for the various activities of the Society. Thorough research has uncovered many possibilities for new sources of Federal funding, from the Heritage Conservation and Recreation Service to the Office of Education. At year's end, proposals and exploratory pre-proposals were in preparation for submission to the National Science Foundation, the Fish and Wildlife Service, the National Endowment for the Arts, and the Land and Water Conservation Fund. This work is only the beginning in what must be an ongoing program to make Federal-agency staff and lawmakers aware of the Society's broad services to the public and to science. Grants were received in 1979 from the Institute of Museum Services and the National Museum Act. On the state level, in addition to major support received from the Natural Heritage Trust, the Society received New York State Council for the Arts funding toward a summer performing-arts program at the Zoo.

REPORT OF THE TREASURER

A new format for reporting revenue and expenditures was adopted in 1979. We believe this format will make analysis of the Society's financial situation easier and more accurate for management and also for interested contributors and members.

According to this new method, two kinds of operating funds are defined: those for general purposes and those for capital outlay. Total revenue for general purposes was \$14,103,305, for capital outlay, \$1,317,475. Expenditures were \$14,506,922 for general purposes and \$1,498,461 for capital purposes, producing a combined deficit of \$584,603.

Inclement weather during the 1979 season resulted in a decline in attendance of 8% at the Zoological Park and 12% at the New York Aquarium. Despite the drop in attendance, per capita expenditures by Zoo visitors rose twenty cents to \$2.70. As one might conclude, 195,000 fewer visitors through the gates contributed greatly to the Society's deficit.

For general operation purposes, the Society's support and revenue was derived from the following sources:

City of New York	32.2%
New York State	8.7
Federal sources	2.0
Admissions and visitor services	20.2
Contributors	16.5
Endowment income	8.4
Membership	4.2
Other	7.8
	<u>100.0%</u>

Total government support as a percentage of expenditures for general and capital purposes remained constant at 42%; however, increased utility costs of \$547,354 placed a greater burden on the Society's resources.

The Society's 1979 expenditures for general operating purposes may be itemized as follows:

Zoological Park	55.3%
New York Aquarium	11.3
Animal Research and Conservation Center	5.3
Publications	5.3
Osborn Laboratories of Marine Sciences	2.8
Membership activities	2.6
St. Catherine's Wildlife Survival Center	1.8
Management and general	12.0
Fund raising	3.6
	<u>100.0%</u>

Expenditures for capital purposes totaled \$1,498,461. These expenses were incurred in connection with nine capital construction projects at the Zoological Park and New York Aquarium. The major expenditures during the year at the Zoo was for the Large Rare Mammals Building. In 1979, \$716,000 was expended on this new and exciting exhibit scheduled to open in 1981. To date, expenditures, on this project funded entirely by generous gifts from Mr. and Mrs. James Walter Carter, have totaled \$912,000. Preliminary planning and architectural fees for the new Children's Zoo, scheduled for late spring of 1981, accounted for \$81,573. A popular attraction at the Zoological Park, the Safari Trains, will be replaced in 1981 with new equipment; \$49,830 was expended for the assembly of trains during the year. Initial costs for the Society's design of the interior exhibits in the Jungle Building amounted to \$48,491. The renovation of the Wolf Wood exhibit, begun in 1978, was completed in 1979 at a cost of \$21,332; design costs for the proposed Baboon Highlands exhibit were \$21,225. At the Aquarium, the major capital expenses were incurred in the completion of the shark exhibit, \$431,336; the renovation of the Whale Tank, \$35,398; and the design cost of a Marine Mammal Holding Facility, \$14,547. In addition, \$64,242 was spent on animals for the Zoo's collection, and \$13,888 was spent on the acquisition of fish and aquatic mammals for the Aquarium.

Several other projects underway in 1979 funded by the City's capital budget are not reflected in the Society's statements: the Jungle Building, and the Flying Cage at the Zoo and the Marine Mammal Holding Facilities at the Aquarium.

The Society's unrestricted and restricted endowment funds totaled \$14,100,000 at December 31, 1979. The Animal Kingdom Fund campaign, to date, has received contributions of \$5,600,000 and pledges of \$3,800,000 for a total of \$9,400,000. These funds comprise the Society's term endowment of which \$700,000 has been used, to date, to fund general and capital projects.

David T. Schiff
Treasurer

AUDITED FINANCIAL STATEMENTS

BALANCE SHEET DECEMBER 31, 1979 WITH COMPARATIVE FIGURES FOR 1978

	1979		1978	
	OPERATING FUNDS	ENDOWMENT FUNDS	OPERATING FUNDS	ENDOWMENT FUNDS
ASSETS:				
Cash	\$ 680,220	813,344	815,560	121,031
Investments (note 2)	8,249,274	6,968,258	8,161,383	6,911,922
Accounts receivable	659,369	—	621,011	—
Grants receivable (note 3)	237,004	—	1,300,371	—
Inventories, at lower of cost or market	315,664	—	297,790	—
Prepaid expenses and deferred charges	330,283	—	377,032	—
	<u>\$ 10,471,814</u>	<u>7,781,602</u>	<u>11,573,147</u>	<u>7,032,953</u>
LIABILITIES AND FUND BALANCES:				
Accounts payable and accrued expenses	669,879	—	868,164	—
Deferred support and revenue — restricted (notes 4 and 7)	3,481,682	—	5,137,146	—
	<u>4,151,561</u>	<u>—</u>	<u>6,005,310</u>	<u>—</u>
Fund balances:				
Unrestricted:				
Designated for long-term investment	5,452,555	—	5,501,065	—
Undesignated	867,698	—	66,772	—
Endowment — income unrestricted	—	2,259,050	—	2,282,156
Endowment — income restricted	—	618,307	—	609,417
Term endowment — income unrestricted	—	4,904,245	—	4,141,380
	<u>6,320,253</u>	<u>7,781,602</u>	<u>5,567,837</u>	<u>7,032,953</u>
Total fund balances	<u>\$ 10,471,814</u>	<u>7,781,602</u>	<u>11,573,147</u>	<u>7,032,953</u>

See accompanying notes to financial statements.

**STATEMENT OF SUPPORT AND REVENUE, EXPENDITURES,
CAPITAL ADDITIONS AND CHANGES IN FUND BALANCES
YEAR ENDED DECEMBER 31, 1979**

	OPERATING FUNDS		ENDOWMENT FUNDS
	GENERAL	CAPITAL OUTLAY	
OPERATING SUPPORT AND REVENUE:			
Contributions	\$ 1,836,399	695,932	—
Fees and grants from governmental agencies	4,775,070	9,860	—
Admission charges	1,427,564	—	—
Visitor services revenues	3,791,509	—	—
Membership dues and travel	465,129	—	—
Endowment and other investment income	940,421	213,820	—
Pension fund revenue (note 6)	200,000	—	—
Publications and related revenues	274,396	—	—
Miscellaneous revenue	262,506	14,128	—
Expiration of term endowment (note 5)	130,311	383,735	—
Total operating support and revenue	14,103,305	1,317,475	—
EXPENDITURES:			
Program services:			
Zoological park	6,382,813	1,003,290	—
Aquarium	1,310,049	495,171	—
Survival Center	200,917	—	—
Animal research and conservation center	610,194	—	—
Marine sciences	327,665	—	—
Publications	614,234	—	—
Visitor services and admissions	2,971,808	—	—
Membership activities	298,663	—	—
Total program services	12,716,343	1,498,461	—
SUPPORTING SERVICES:			
Management and general	1,386,047	—	—
Fund raising	404,532	—	—
Total supporting services	1,790,579	—	—
Total expenditures	14,506,922	1,498,461	—
Excess of expenditures over operating support and revenue, carried forward	(403,617)	(180,986)	—

continued

**STATEMENT OF SUPPORT AND REVENUE, EXPENDITURES,
CAPITAL ADDITIONS AND CHANGES IN FUND BALANCES, CONTINUED**

	OPERATING FUNDS		ENDOWMENT FUNDS
	GENERAL	CAPITAL OUTLAY	
Excess of expenditures over operating support and revenue, brought forward	\$ (403,617)	(180,986)	—
Bequests	468,857	—	—
Realized net losses on investments.	(76,812)	—	—
Visitor services revenues applicable to prior years' capital projects (note 4)	944,974	—	—
Excess of support and revenue over expenditures before capital additions	933,402	(180,986)	—
Capital additions:			
Contributions and bequests	—	—	1,300,951
Realized net losses on investments	—	—	(38,256)
Total capital additions	—	—	1,262,695
Excess of support and revenue over expenditures after capital additions	933,402	(180,986)	1,262,695
Fund balances at beginning of year	5,567,837	—	7,032,953
Other changes:			
Expiration of term endowment (note 5)	—	—	(514,046)
Capital outlay financed by general funds	(180,986)	180,986	—
Fund balances at end of year	\$ 6,320,253	—	7,781,602

See accompanying notes to financial statements

STATEMENT OF CHANGES IN FINANCIAL POSITION
YEAR ENDED DECEMBER 31, 1979

	<u>OPERATING FUNDS</u>	<u>ENDOWMENT FUNDS</u>
RESOURCES PROVIDED:		
Excess of support and revenue over expenditures before capital additions	\$ 752,416	—
Capital additions:		
Contributions	—	1,300,951
Realized net losses on investments	—	(38,256)
Excess of support and revenue over expenditures after capital additions	752,416	1,262,695
Items which do not use resources — realized net losses on investment transactions	117,046	38,256
Decrease in grants receivable	1,063,367	—
Decrease in prepaid expenses and deferred charges	46,749	—
Proceeds from the sale of investments	2,053,275	2,484,653
Total resources provided	4,032,853	3,785,604
RESOURCES USED:		
Increase in accounts receivable	38,358	—
Increase in inventories	17,874	—
Decrease in accounts payable and accrued expenses	198,285	—
Decrease in deferred support and revenue	1,655,464	—
Purchase of investments	2,258,212	2,579,245
Total resources used	4,168,193	2,579,245
OTHER CHANGES:		
Expiration of term endowment	—	(514,046)
Increase (decrease) in cash	\$ (135,340)	692,313

See accompanying notes to financial statements.

NOTES TO FINANCIAL STATEMENTS

DECEMBER 31, 1979

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The financial statements of the Society have been prepared on the accrual basis except for depreciation as explained below. Other significant accounting policies follow:

Fund Accounting

In order to ensure observance of limitations and restrictions placed on the use of available resources, the accounts are maintained in accordance with the principles of fund accounting. This is the procedure by which resources for various purposes are classified for accounting and reporting purposes into funds established according to their nature and purposes. Separate accounts are maintained for each fund; however, in the accompanying financial statements, funds that have similar characteristics have been combined into fund groups.

The assets, liabilities and fund balances of the Society are reported in two self-balancing fund groups:

Operating funds, which include unrestricted and restricted resources:

- Unrestricted funds represent the portion of operating funds available for the support of Society operations.
- Funds restricted by the donor, grantor, or other outside party for particular operating purposes (including accessions and other capital additions) are deemed to be earned and reported as revenues of the operating funds when the Society has incurred expenditures in compliance with the specific restrictions. Such amounts received but not yet earned are reported as restricted deferred amounts.

Endowment funds, which include the following restricted resources:

- Funds that are subject to restrictions of gift instruments requiring in perpetuity that the principal be invested and only the income be used.
- Term endowment funds which must be held intact except that, at some future date or specified occurrence, some portion or all of the principal may be used (see note 5).

Plant Assets and Depreciation

Expenditures of operating funds for plant acquisitions including buildings and improvements constructed on land owned by the City of New York are not capitalized, and accordingly depreciation is not recorded in the Society's financial statements.

Collections

Expenditures for collections are not capitalized.

Other Matters

All gains and losses arising from the sale, collection or other disposition of investments and other noncash assets are accounted for in the fund that owned the assets. Ordinary income from investments, receivables, and the like is accounted for in the fund owning the assets, except for income derived from investments of endowment funds, which is accounted for, if unrestricted, as revenue of the unrestricted operating fund or, if restricted, as deferred amounts until the terms of the restriction have been met.

Enforceable pledges for operating purposes, less an allowance for uncollectible amounts, are recorded as receivables in the year made. Pledges for support of current operations are recorded as operating fund support. Pledges for support of future operations are recorded as deferred amounts in the operating fund. Pledges to the Animal Kingdom Fund are recognized upon payment of the pledge.

2. INVESTMENTS

Investments are reflected at cost or fair market value at date of gift. The market value and cost of investments by fund were as follows:

	1979		1978	
	MARKET VALUE	CARRYING VALUE	MARKET VALUE	CARRYING VALUE
Operating funds — expendable	\$ 8,840,773	8,249,274	8,064,550	8,161,383
Endowment funds — nonexpendable	7,206,396	6,968,258	6,778,163	6,911,922
	<u>\$ 16,047,169</u>	<u>15,217,532</u>	<u>14,842,713</u>	<u>15,073,305</u>
Investments are composed of the following:				
Short-term investments	1,643,000	1,643,000	2,086,000	2,086,000
Corporate stocks	9,131,700	7,503,396	7,308,979	7,015,295
Corporate bonds	2,417,375	2,852,709	2,197,218	2,453,759
U.S. Government obligations	2,848,785	3,212,118	3,237,925	3,505,660
Note receivable	6,309	6,309	12,591	12,591
	<u>\$ 16,047,169</u>	<u>15,217,532</u>	<u>14,842,713</u>	<u>15,073,305</u>

The following tabulation summarizes changes in relationships between carrying values and market values of investment assets:

	MARKET VALUES	CARRYING VALUES	NET GAINS (LOSSES)
End of year	\$ 16,047,169	15,217,532	829,637
Beginning of year	<u>14,842,713</u>	<u>15,073,305</u>	<u>(230,592)</u>
Unrealized net gains for the year			1,060,229
Realized net losses for the year			<u>(155,302)</u>
Total net gains for the year			<u>\$ 904,927</u>

The average annual yield, exclusive of net gains, was 6.7%.

The New York State Not-for-Profit Corporation Law, which became effective on September 1, 1970, permits the use of realized gains on investment transactions of endowment funds. Such gains are currently being added to principal but may be utilized at the discretion of the Board of Trustees.

3. GRANTS RECEIVABLE

Grants receivable of the operating funds represent amounts pledged to the Society for certain operations and for the completion of particular projects in future years. The grants are expected to be collected as expenditures for those projects made by the Society.

**4. VISITOR SERVICES REVENUES
APPLICABLE TO PRIOR YEARS
CAPITAL PROJECTS**

During 1979, the Society determined that it was appropriate to utilize previously deferred visitor services revenue to finance certain capital projects of prior years. Accordingly, \$944,974 has been reported as revenue applicable to such capital projects in the accompanying financial statements.

5. TERM ENDOWMENT

During 1976, the Society initiated the Animal Kingdom Fund as a capital funds drive. The Fund was established as a term endowment fund to serve various functions — to provide revenue for animal operations, and to finance programs and improved facilities to produce revenue and increase attendance, as well as to provide the Society with a "survival" fund in the event that its other sources of revenue become insufficient to maintain the Society's programs. As a term endowment, the Fund is subject to the following conditions:

- (a.) The income of the Animal Kingdom Fund shall be used for the general operating purposes of the Society; and
- (b.) The principal of the Animal Kingdom Fund may be expended only upon the affirmative vote of two-thirds of the Trustees present at any duly held meeting of the Board of Trustees or its Executive Committee (i) to finance programs or improvements to facilities (i.e., the Bronx Zoo, the New York Aquarium, or other facilities of the Society) to produce revenue or increase attendance, or (ii) to ensure the survival of the Society if funds from other sources fail to provide sufficient revenue to maintain the Society's programs; and, provided, however, that in the case of any contribution to the Animal Kingdom Fund which was subject to a restriction not to expend the principal of such contribution without the prior consent of the donor thereof, in addition to the vote of the Trustees described above, such consent must be obtained in writing prior to the expenditure of such principal. During 1979, the Society recognized in operating funds expired term endowments aggregating \$514,046.

Such funds were utilized as follows:

Shark exhibit	\$252,332
Children's Zoo	81,573
Tour trains	49,830
Capital planning	49,778
Central Park Zoo project	40,260
Other	40,273

Total	<u>\$514,046</u>
-------	------------------

Pledges to the Animal Kingdom Fund aggregating approximately \$3,328,000 are due to be collected as follows:

YEAR	AMOUNT
1980	\$ 1,465,000
1981	911,000
1982	637,000
1983	275,000
1984	5,000
1985-1987	<u>35,000</u>

6. PENSION PLAN

All eligible Society employees are members of the Cultural Institutions Retirement System's (CIRS) Pension Plan. Pension expense was approximately \$680,000, of which approximately \$318,000 was financed by an appropriation from the City of New York. The current year's provision includes amortization of prior service cost over a period of 30 years commencing June 30, 1974. The Society's policy is to fund pension cost accrued and no unfunded vested benefits existed as of June 30, 1979, the date of the latest plan valuation.

Certain employees of the Society were formerly participants in the Society's pension fund. Effective January 1, 1975, benefits of the CIRS Plan were substituted for benefits previously accrued under the Society's pension fund. The market value of the assets of the pension fund approximated \$1,635,000 as of December 31, 1979. These assets will be used to fund current pension costs and as yet undetermined past service costs relating to substitution of CIRS benefits for periods prior to January 1, 1975. During 1979, \$200,000 was used for pension payments and is reflected as revenue and expense in operating funds. Based on preliminary estimates, it is the opinion of management that the assets of the pension fund will be sufficient to fund these past service costs.

7. DEFERRED RESTRICTED SUPPORT AND REVENUE

The changes in deferred support and revenue for the year ended December 31, 1979 are as follows:

Balances at beginning of year	\$ 5,137,146
Additions:	
Contributions and bequests	820,826
Fees and grants from governmental agencies	4,686,855
Admission charges and visitor services revenues	5,219,073
Investment income	332,313
Net loss on investment transactions	(40,234)
Special events	210,681
Expiration of term endowment	514,046
Other	225,894
	<u>17,106,600</u>
Deduction — funds expended during year	<u>13,624,918</u>
Balances at end of year	<u>\$ 3,481,682</u>

8. COLLECTIONS

During 1979, accessions of collections aggregated \$78,131 while deaccessions aggregated \$14,128.

9. OTHER

The Society is the ultimate beneficiary under a trust held by Community Funds, Inc. of New York, N.Y. The income arising from the investments of the principal is paid to the Society for restricted operating purposes.



Peat, Marwick, Mitchell & Co.

The Board of Trustees
New York Zoological Society:

We have examined the balance sheet of New York Zoological Society as of December 31, 1979 and the related statements of support and revenue, expenditures, capital additions and changes in fund balances and of changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

As explained in note 1 to the financial statements, expenditures for land, buildings and equipment are not capitalized, and depreciation of buildings and equipment is, therefore, not recorded. Such practices are not in accordance with generally accepted accounting principles.

In our opinion, except for the effect on the financial statements of the matter discussed in the preceding paragraph, the aforementioned financial statements present fairly the financial position of New York Zoological Society at December 31, 1979 and the results of its operations and the changes in its financial position for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

August 14, 1980

Peat, Marwick, Mitchell & Co.

CONTRIBUTIONS

INDIVIDUALS AND FOUNDATIONS

CONTRIBUTIONS, PLEDGES AND PAYMENTS ON PLEDGES OF \$1,000 AND OVER
JANUARY 1 - DECEMBER 31, 1979

The Achelis Foundation
Douglas H. Alexander, Esq.
The Annenberg Fund, Inc.
Arkville Erpf Fund Inc.
Mrs. Vincent Astor
The Vincent Astor Foundation
Mrs. Isabel H. Ault
David, Josephine & Winfield Baird Foundation
The George F. Baker Trust
James M. & Margaret R. Barker Foundation
The Baker Welfare Foundation
The Theodore H. Barth Foundation
Charles Ulrick & Josephine Bay Foundation, Inc.
The Frederick W. Beinecke Fund
Mrs. Harry Payne Bingham
Samuel J. Bloomingdale Foundation, Inc.
Mr. and Mrs. Robert E. Blum
The Bodman Foundation
The Albert C. Bostwick Foundation
Miss Georgiana E. Brooks
Mrs. Helen W. Buckner
Mr. and Mrs. James Walter Carter
Guy F. Cary
Dorothy Jordan Chadwick Fund
The Clark Foundation
Mrs. F. Ambrose Clark
William Conway
Mrs. Ida Coppola
Mrs. Morgan Cowperthwaite
Louise B. and Edgar Cullman Foundation
Charles E. Culpeper Foundation, Inc.
The Dammann Fund, Inc.
Charles W. Deeds
Margarita Victoria Delacorte Foundation
Geraldine R. Dodge Foundation Incorporated
The Doris Duke Foundation
The Caleb C. and Julia W. Dula Educational and
Charitable Foundation
The Dunlevy Milbank Foundation, Inc.
Estate of John Elliott
Blanche T. Enders Trust
Ostrom Enders
The Charles Engelhard Foundation
Mrs. Charles W. Engelhard, Jr.
The Eppley Foundation for Research, Inc.
The Arthur T. Erickson Foundation
The William Ewing Foundation
The Explorers Club
Mr. and Mrs. William Ward Foshay
Foundation for the Needs of Others, Inc.
Dr. and Mrs. Henry Clay Frick II
Conservatorship Estate of Elizabeth F. Gamble
Louis Garguilo
Peter R. Gimbel
Mrs. D. Coleman Glover
Robert G. Goelet
Edmund J. Greco
The Griffis Foundation, Inc.
Raymond R. Guest
The Guinzburg Fund

Mr. and Mrs. Henry Guthrie
Mr. and Mrs. Alexander S. Haig
Evelyn Jaffe Hall Charitable Trust
Mrs. Melville Hall
Mary W. Harriman Foundation
Mrs. Enid A. Haupt
Charles Hayden Foundation
William Randolph Hearst Foundation
Justus Heijmans Foundation
H.J. Heinz II Charitable & Family Trust
High Winds Fund, Inc.
Mrs. George L. Hinman
Audrey P. Holden Charitable Trust
Homeland Foundation
Janet A. Hooker Charitable Trust
Mr. and Mrs. Jack R. Howard
Mrs. Kenneth Ives
J.I. Foundation
Estate of Fanny King
F. M. Kirby Foundation, Inc.
Robert J. Kleberg & Helen C. Kleberg Foundation
Estate of Bruno Kraushaar
The Kresge Foundation
Benjamin Lambert
Frank Y. Larkin
The Alexander M. & Judith W. Laughlin
Foundation
Estate of Mable Little
Mr. and Mrs. John H. Livingston
The Joe & Emily Lowe Foundation, Inc.
David Hunter McAlpin
Estate of Fleur V. McCamish
Mr. and Mrs. C. Richard MacGrath
John D. Macomber
The Mandeville Foundation
Townsend B. Martin
William McChesney Martin, Jr.
The Joseph Martinson Memorial Fund
The Louis Marx Foundation Inc.
Otto Marx, Jr.
Peter Matthiessen
Mr. and Mrs. John Mayer
Merck Family Fund
The Charles E. Merrill Trust
James F. Miller
Mrs. Minot Milliken
Barclay Morrison
Henry & Lucy Moses Fund, Inc.
Muskiewinni Foundation
NFL Charities
Estate of Pedro Nahabian
National Geographic Society
National Historical Publications &
Records Commission
Mr. and Mrs. Charles W. Nichols, Jr.
Nichols Foundation, Inc.
Edward John Noble Foundation
Jessie Smith Noyes Foundation
Mr. and Mrs. Augustus G. Paine
The Lucile B. and Marcel A. Palmaro Fund

The Perkin Fund
 Mr. and Mrs. Howard Phipps, Jr.
 Howard Phipps Family Charitable Foundation
 John H. Phipps
 John Pierrepont
 Pine Level Foundation
 Mr. and Mrs. Sumner Pingree III
 The Pleasant Street Foundation
 Miss Mary Jane Pool
 Mrs. John L. Procope, Jr.
 Eben W. Pyne
 Charles Rain
 Mr. and Mrs. Harmon L. Remmel
 Harmon L. Remmel Fund
 Mrs. William C. Ridgeway, Jr.
 Rockefeller Brothers Fund, Inc.
 Laurance S. Rockefeller
 Mr. and Mrs. Milton F. Rosenthal
 The Rudin Foundation, Inc.
 George D. Ruggieri, S.J.
 The William R. & Virginia F. Salomon
 Family Foundation
 John T. Sargent
 The Schiff Foundation
 Mrs. Charles B. Scully
 Sea Island Foundation, Inc.

Elizabeth Bayne Shields Fund
 Donald W. Scholle
 The Seth Sprague Educational and Charitable
 Foundation
 The Stebbins Fund, Inc.
 E.C. Stollenwerck
 Robert C. Stone, Jr.
 Mrs. Arthur Hays Sulzberger
 Mrs. F. K. Thayer, Jr.
 Mrs. Joseph A. Thomas
 The Thorne Foundation
 Mr. and Mrs. Clarence William Vandergrift
 The G. Unger Vetlesen Foundation
 Mrs. Lila Acheson Wallace
 Mrs. Victor Weybright
 Mrs. Taggart Whipple
 Whitehall Foundation, Inc.
 H. W. Wilson Foundation
 The Robert and Marilyn Wilson Foundation
 Robert Winthrop
 The Harper Woodward Foundation, Inc.
 World Wildlife Fund
 Mrs. Alfred J. Yardley
 The Yorkshire Fund
 Nicholas D. Zigo
 Three anonymous gifts

ANNUAL CAMPAIGN FOR CORPORATE SUPPORT

CONTRIBUTIONS, PLEDGES AND PAYMENTS ON PLEDGES OF \$1,000 AND OVER
 JANUARY 1 - DECEMBER 31, 1979

ACF Foundation Inc.
 AMAX Foundation, Inc.
 AMOCO Foundation
 Alexander & Green
 Allied Chemical Foundation
 American Express Foundation
 American Re-Insurance Company
 American Standard Foundation
 American Telephone and
 Telegraph Company
 Avon Products Foundation, Inc.
 H.L. Bache Foundation, Inc.
 Bankers Trust Company
 The Siegfried and Josephine
 Bieber Foundation
 Bloomingdale Bros.
 Bristol-Myers Fund
 Bunge Corporation
 Celanese Corporation
 The Chase Manhattan Bank N.A.
 Chesebrough-Pond's, Inc.
 The Chubb Corporation
 Citibank, N.A.
 City Investing Company
 Foundation
 Collins & Aikman Corporation
 Colt Industries Inc.
 Consolidated Edison Company
 of New York, Inc.
 Crum & Forster Insurance
 Companies

The Dammann Fund
 Dollar Savings Bank
 Doubleday & Company, Inc.
 Dun & Bradstreet Companies
 Foundation Inc.
 Engelhard Hanovia, Inc.
 Engelhard Minerals & Chemicals
 Corporation
 Exxon Corporation
 F. William Free & Co., Inc.
 Freeport Minerals Company
 General Cigar & Tobacco Co.
 General Foods Corporation
 Grace Foundation
 The Guinzburg Fund
 The Gulf + Western Foundation
 Justus Heijmans Foundation
 The Hennessy Foundation
 International Business
 Machines Corporation
 International Paper Company
 Foundation
 International Telephone and
 Telegraph Corporation
 Johnson & Higgins
 Lehman Brothers Kuhn Loeb, Inc.
 Lever Brothers Company
 Foundation, Inc.
 R.H. Macy & Co., Inc.
 Manufacturers Hanover
 Foundation

Marsh & McLennan Companies Inc.
McCann Erickson, Inc.
Metropolitan Life Foundation
Morgan Guaranty Trust
Company of New York
Morgan Stanley Foundation
New York Seven-Up Bottling Co., Inc.
New York Telephone Co.
The New York Times
Company Foundation, Inc.
Newsweek
North American Reinsurance
Corporation
Ogilvy & Mather International, Inc.
Peat, Marwick, Mitchell & Co.
J.C. Penney Company Inc.
Pfizer Inc.
Philip Morris Incorporated
Miss Mary Jane Pool
Price Waterhouse & Co.
The Prudential Foundation
RCA Corporation
Revlon Foundation, Inc.
Rockefeller Center Inc.

Mr. Milton F. Rosenthal
Helena Rubinstein Foundation, Inc.
S. & H. Foundation
The William R. and Virginia F.
Salomon Family Foundation, Inc.
The Scherman Foundation, Inc.
Schlumberger Horizons, Inc.
David Schwartz Foundation, Inc.
The Seamen's Bank for Savings
The Sperry and Hutchinson Company
Sperry Corporation
Texaco Inc.
The Oakleigh L. Thorne Foundation
Time Incorporated
Transway International Foundation
Tudor Foundation, Inc.
Union Carbide Corporation
Union Pacific Foundation
United Industrial Corporation
Universal Leaf Foundation
Warner-Lambert Foundation
The Wasserman Foundation
John Wiley & Sons, Inc.
The H.W. Wilson Foundation

ANIMAL KINGDOM FUND

**CONTRIBUTIONS, PLEDGES AND PAYMENTS ON PLEDGES OF \$1,000 AND OVER
JANUARY 1 - DECEMBER 31, 1979**

Celanese Corporation
Chemical Bank
Grace Foundation
McGraw Hill Foundation
Mobil Foundation

Morgan Guaranty Trust Company
of New York
New York Telephone Company
Philip Morris Incorporated

WOMEN'S COMMITTEE CORPORATE CONTRIBUTIONS

**CONTRIBUTIONS, PLEDGES AND PAYMENTS ON PLEDGES OF \$1,000 AND OVER
JANUARY 1 - DECEMBER 31, 1979**

Continental Group Foundation
Lewco Securities
Lord & Taylor
NFL Charities

Gifts-in-Kind
Champion Papers
Consolidated Papers
FPA Corporation
Ogilvy & Mather International Inc.

OSBORN LABORATORIES OF MARINE SCIENCES

**CONTRIBUTIONS, PLEDGES AND PAYMENTS ON PLEDGES OF \$1,000 AND OVER
JANUARY 1 - DECEMBER 31, 1979**

Big J. Demolition & Excavation Co., Inc.
Louis P. Canuso, Inc.
Coney Island Enterprises Inc.
Consumer Carpet Workroom, Inc.

Leon D. DeMatteis & Sons Inc.
Rosemont Linen Supply
Sirena Restaurant, Inc.

BOARD OF TRUSTEES AND NEW YORK ZOOLOGICAL

THE BOARD OF TRUSTEES AT DECEMBER 31, 1979

Officers

Laurance S. Rockefeller
Honorary Chairman of the Board
Howard Phipps, Jr.
President
Charles W. Nichols, Jr.
Chairman of the Executive Committee
Henry Clay Frick II
Vice President
Mrs. William Ward Foshay
Vice President
John Pierrepont
Vice President
David T. Schiff
Treasurer
Frederick A. Melhado
Secretary
Harold C. Palmer
Assistant Secretary

Trustees

Alexander Aldrich
Mrs. Vincent Astor
George F. Baker, III
Guy F. Cary
John Elliott, Jr.
C. Sims Farr
Mrs. William Ward Foshay
Henry Clay Frick II
Robert G. Goelet
Nixon Griffiths
Gilbert M. Grosvenor
John N. Irwin II
Frank Y. Larkin
Dan W. Lufkin
John D. Macomber
Anthony D. Marshall
Otto Marx, Jr.
Frederick A. Melhado
G.W. Merck

Charles W. Nichols, Jr.
Augustus G. Paine
Richard T. Perkin
Howard Phipps, Jr.
John H. Phipps
John Pierrepont
Mrs. John L. Procope, Jr.
Richard I. Purnell
Eben W. Pyne
Laurance S. Rockefeller
Guy G. Rutherford
John T. Sargent
David T. Schiff
Chauncey D. Stillman
Judith C. Symonds
Landon K. Thorne, Jr.
Lila Acheson Wallace

Ex-Officio Trustees

The Mayor, City of New York
The Commissioner, Cultural Affairs
The President, Borough of the Bronx
The President, Borough of Brooklyn

Board of Advisors

Robert E. Blum
James Walter Carter
Mrs. Edgar M. Cullman
Peter R. Gimbel
Peter Grimm
Mrs. Driggs Hultkrans
David Hunter McAlpin
Peter Matthiessen
Sumner Pingree III
John M. Schiff
Walter C. Teagle III
Mrs. Joseph A. Thomas
Alice Tully
Mrs. Gerritt P. Van de Bovenkamp
Robert Winthrop

COMMITTEES OF THE SOCIETY

STANDING COMMITTEES OF THE BOARD OF TRUSTEES

AT DECEMBER 31, 1979

Executive Committee

Charles W. Nichols, Jr., *Chairman*
Mrs. Vincent Astor
John Elliott, Jr.
Mrs. William Ward Foshay
Henry Clay Frick II
Nixon Griffis
John N. Irwin II
Frank Y. Larkin
Frederick A. Melhado, *ex-officio*
Howard Phipps, Jr., *ex-officio*
John Pierrepont
Laurance S. Rockefeller
John T. Sargent
David T. Schiff, *ex-officio*

Auditing Committee

Frederick A. Melhado, *Chairman*
Guy F. Cary
Howard Phipps, Jr., *ex-officio*
John Pierrepont
David T. Schiff

Business Operations Committee

Dan W. Lufkin, *Chairman*
Frank Y. Larkin
Charles W. Nichols, Jr., *ex-officio*
Howard Phipps, Jr., *ex-officio*
David T. Schiff, *ex-officio*

Finance Committee

Frederick A. Melhado, *Chairman*
George F. Baker, III
Guy F. Cary
Howard Phipps, Jr., *ex-officio*
John Pierrepont
David T. Schiff, *ex-officio*

Nominating Committee

Frank Y. Larkin, *Chairman*
Mrs. William Ward Foshay
Henry Clay Frick II
Frederick A. Melhado
Augustus G. Paine
Howard Phipps, Jr., *ex-officio*

COMMITTEES OF THE NEW YORK ZOOLOGICAL SOCIETY

AT DECEMBER 31, 1979

Animal Kindgom Fund Committee

John N. Irwin II, *Chairman*
Mrs. Vincent Astor, *Vice-chairman*
John Pierrepont, *Vice-chairman*
John T. Sargent, *Vice-chairman*
John H. Adams
Alexander Aldrich
John D. Backe
George F. Baker, III
Edward Larabee Barnes
Leonard Bernstein
Robert E. Blum
John Cage
James Walter Carter
Guy F. Cary
John Chancellor
Craig Claiborne
Ramsey Clark
Judy Collins
William Conway
Edward N. Costikyan
George Crumb
Joseph F. Cullman 3rd
Stephen I. D'Agostino
Philippe de Montebello
Barbaralee Diamonstein
Rene Dubos
John Elliott, Jr.
Osborn Elliott
Ralph Ellison

Mrs. Charles W. Engelhard
Amitai Etzioni
C. Sims Farr
Mrs. William Ward Foshay
Henry Clay Frick II
Brendan Gill
Peter R. Gimbel
Robert G. Goelet
Harmon H. Goldstone
Edward Gorey
Nixon Griffis
Tammy Grimes
Gilbert M. Grosvenor
Bernhard Grzimek
Thomas H. Guinzburg
August Heckscher
Andrew Heiskell
Lillian Hellman
Mrs. Ernest Hemingway
Nat Hentoff
Katharine Hepburn
Jacob Javits
Arnold P. Johnson
Henry A. Kissinger
Edward E. Klein
Hilary Knight
Frank Y. Larkin
Joshua Lederberg
Samual J. Lefrak
Roy Lichtenstein

John V. Lindsay
 Royal Little
 Dan W. Lufkin
 John D. Macomber
 Peter Marler
 Alton G. Marshall
 Anthony D. Marshall
 William McChesney Martin, Jr.
 Otto Marx, Jr.
 Peter Matthiessen
 David Hunter McAlpin
 William J. McGill
 Harold W. McGraw
 Frederick A. Melhado
 G.W. Merck
 Daniel P. Moynihan
 Rupert Murdoch
 Louise Nevelson
 Charles W. Nichols, Jr.
 Augustus G. Paine
 William S. Paley
 Joseph Papp
 Roger S. Payne
 Richard T. Perkin
 Howard Phipps, Jr.
 John H. Phipps
 Harold Prince
 Mr. & Mrs. John L. Procope, Jr.
 Eben W. Pyne
 Robert Rauschenberg
 Henry Hope Reed
 William K. Reilly
 Mrs. Harmon L. Rimmel
 Laurance S. Rockefeller
 Julius Rudel
 Thomas R. Rudel
 George D. Ruggieri
 Guy G. Rutherford
 George Schaller
 Arlie Schardt
 David T. Schiff
 John M. Schiff
 Arthur Schlesinger, Jr.
 Richard J. Schwartz
 Irene Selznick
 Paul Simon
 Stephen Sondheim
 Elvis J. Stahr
 Mrs. A. H. Stevenson
 Chauncey D. Stillman
 Gardner D. Stout
 Judith C. Symonds
 Mrs. Joseph A. Thomas
 Landon K. Thorne, Jr.
 Russell E. Train
 Mrs. George L. Unis
 Mrs. Gerritt P. Van de Bovenkamp
 William vanden Heuvel
 Lila Acheson Wallace
 Mr. & Mrs. William H. Whyte
 Edward O. Wilson
 Robert Winthrop
 Mrs. Whitney Young, Jr.

*Aquarium and Osborn Laboratories
 Planning Committee*

Henry Clay Frick II, *Chairman*
 George F. Baker, III
 Peter R. Gimbel
 Nixon Griffis
 Richard T. Perkin
 Howard Phipps, Jr.
 John Pierrepont

Business Committee

Edgar M. Cullman, *Co-chairman*
 John Elliott, Jr., *Co-chairman*
 Stuart K. Atha
 Bill Blass
 Guy F. Cary
 Henry A. Correa
 Joseph F. Cullman 3rd
 Stephen I. D'Agostino
 Paul W. Douglas
 A. Edwin Fein
 Andre Galerne
 Thomas H. Guinzburg
 Walter E. Hanson
 Arthur Hauspurg
 Edwin A. Heard
 John F. Hennessy, Jr.
 Jack R. Howard
 Eugene H. Kummel
 Dan W. Lufkin
 Alton G. Marshall
 Otto Marx, Jr.
 David B. McCall
 Donald F. McCullough
 William J. McNamara
 Frederick A. Melhado
 John A. Millington
 Hiram F. Moody, Jr.
 John Pierrepont
 Mary Jane Pool
 Mrs. John L. Procope, Jr.
 Richard I. Purnell
 Eben W. Pyne
 John T. Sargent
 Richard J. Schwartz
 Oakleigh B. Thorne
 Douglas P. Warwick
 Robert Winthrop

Conservation Committee

Frank Y. Larkin, *Chairman*
 Donald F. Bruning
 James Walter Carter
 William Conway
 Mrs. Edgar M. Cullman
 Allerton Cushman
 James G. Doherty
 Mrs. William Ward Foshay
 Henry Clay Frick II
 Robert G. Goelet
 Nixon Griffis
 Mrs. Philip D. Holden
 Anthony D. Marshall
 John Mayer
 G.W. Merck

Charles W. Nichols, Jr.
Harold C. Palmer
Roger S. Payne
Howard Phipps, Jr.
John H. Phipps
Harmon L. Remmel
George D. Ruggieri
George B. Schaller
Chauncey D. Stillman
Thomas T. Struhsaker
Landon K. Thorne, Jr.
David Western

Development Committee

John Pierrepont, *Chairman*
Mrs. Vincent Astor, *Vice-chairman*
Guy F. Cary
John Elliott, Jr.
Mrs. William Ward Foshay
Nixon Griffis
John N. Irwin II
Frank Y. Larkin
John D. Macomber
Frederick A. Melhado
Howard Phipps, Jr.
Mrs. John L. Procope, Jr.
Laurance S. Rockefeller
Judith C. Symonds

Editorial Committee

John T. Sargent, *Chairman*
William Conway
Gilbert M. Grosvenor
Peter Matthiessen
George D. Ruggieri
George B. Schaller
Eugene J. Walter, Jr.

Education Committee

Judith C. Symonds, *Chairman*
Christopher Angell
Annette Berkovits
Mrs. Edwin Cohen
William Conway
Nixon Griffis
Karen Hensel
Frank Y. Larkin
Richard Lattis
Thomas Leahy
Gregory Long
John McKew
Howard Phipps, Jr.
David A. Prager
Mrs. John L. Procope, Jr.
Arthur Ross
George D. Ruggieri
Edward Russell, Jr.
Mrs. John S. Samuels, III
John T. Sargent
Jenny Bell Whyte

Exploration and Collection Committee

Landon K. Thorne, Jr., *Chairman*
James Walter Carter
William Conway
James G. Doherty
Edwin Gould
Nixon Griffis
Frank Y. Larkin
Peter Matthiessen
G.W. Merck
Howard Phipps, Jr.
George D. Ruggieri

Women's Committee Board of Directors

Mrs. Driggs Hultkrans
President
Miss Lynn Chase
Vice President
Mrs. Chalmers Dale
Vice President
Mrs. Thomas L. Pulling
Vice President & Secretary
Mrs. Alexander B. Slater
Treasurer
Mrs. George Moss
Asst. Treasurer
Mrs. John R. Preston
Asst. Secretary
Mrs. Norbert A. Bogdan
Mrs. Charles A. Dana, Jr.
Mrs. R. Leigh Duemler
Mrs. William Ward Foshay
Mrs. Ridgely W. Harrison
Mrs. Jack R. Howard
Miss Julie Kammerer
Mrs. Alfred L. Loomis III
Miss Nina Mortellito
Mrs. Sealy Newell
Mrs. Gordon B. Pattee
Mrs. Eben W. Pyne
Mrs. Tucker Ridder
Mrs. Joseph R. Siphron
Mrs. James F. Stebbins
Mrs. Joseph A. Thomas
Mrs. Harper Woodward

Women's Committee Advisory Board

Mrs. Vincent Astor
Mrs. Charles W. Nichols, Jr.
Mrs. Harmon L. Remmel
Mrs. Anne H. Stevenson
Mrs. Landon K. Thorne, Jr.

STAFF OF THE NEW YORK ZOOLOGICAL SOCIETY AT DECEMBER 31, 1979

William Conway, *General Director*; John G. Hoare, *Comptroller*; John McKew, *Director of Administrative Services*; Timothy O'Sullivan, *Deputy Director of Administration*; Gregory Long, *Deputy Director for Development and Membership*; Marie Sexton, *Membership Chairman*; Arnold Harlem, *Business Manager*; James P. White, *Personnel Manager*; Dolores Hoglund, *Accounting Manager*; Robert S. Kosturak, *Curator, Exhibition & Graphic Arts*; Eugene J. Walter, Jr., *Editor & Curator, Publications & Public Relations*; Joan Van Haasteren, *Curator, Public Relations & Promotions*; William Meng, *Assistant Curator, Photographic Services*; Penelope O'Prey, *Assistant Curator, Publications*; William Bridges, *Curator of Publications Emeritus*

New York Zoological Park

William Conway, *Director*; David Cole, *Deputy Director of Operations*; James G. Doherty, *General Curator & Curator Mammalogy*; Joseph Bell, *Scientific Assistant to the Director & Honorary Chairman, Ornithology*; Donald F. Bruning, *Curator, Ornithology*; John L. Behler, *Curator, Herpetology*; Mark C. MacNamara, *Associate Curator, Mammalogy*; Richard Lattis, *Curator, Education*; Annette Berkovits, *Assistant Curator, Education*; Michael Gallo, *Manager, Security*; Joseph McCormick, *Manager, Transportation*; Charles B. Driscoll, *Director of Operations Emeritus*; Grace Davall, *Curator Emeritus*; Roland Lindemann, *Consultant, Mammal Management*; Jean Delacour, *Ostrom Enders, Winston Guest, Jr., Frank Y. Larkin, William K. Macy, Jr., S. Dillon Ripley, Charles Siville, Charles D. Webster, Field Associates in Ornithology*; Joseph A. Davis, *Field Associate in Mammalogy*; William H. Zovickian, *Field Associate in Herpetology*

New York Aquarium

George D. Ruggieri, S.J., *Director*; U. Erich Friese, *Deputy Director*; Gordon D. Clark, *Manager, Operations*; Kenneth Gold, *Curator, Protista*; Klaus D. Kallman, *Curator, Fishes*; Paul J. Cheung, *Assistant Curator, Invertebrates*; Karen Hensel, *Curator, Education*

Osborn Laboratories of Marine Sciences

George D. Ruggieri, S.J., *Director & Experimental Embryologist*; Kenneth Gold, *Assistant Director & Marine Ecologist*; Ross F. Nigrelli, *Senior Scientist*; Paul J. Cheung, *Pathologist*; Klaus D. Kallman, *Fish Geneticist*; Hao Howard Sun, *Natural Products Chemist*; Eli D. Goldsmith, *Scientific Consultant*; C. M. Breder, Jr., *Research Associate, Ichthyology*; Erwin J. Ernst, *Research Associate, Estuarine & Coastal Ecology*; Myron Jacobs, *Research Associate, Cetacean Neuroanatomy*; Martin P. Schreibmann, *Research Associate, Fish Endocrinology*

Animal Research and Conservation Center

George B. Schaller, *Director & Research Zoologist*; Roger S. Payne, Thomas Struhsaker, *Research Zoologists*; David Western, *Resource Ecologist*; Walter Auffenberg, F. Wayne King, Federico Medem, Russell Mittermeier, Bernard Peyton, Stanley Temple, *Conservation Fellows*; Iain Douglas-Hamilton, Alison K. K. Hillman, Cynthia Moss, Katherine Payne, *Research Fellows*

Wildlife Survival Center

John Lukas, *Associate Curator in Residence*; Morton Silberman, *Clinical Consultant*

Animal Health

Emil P. Dolensek, *Veterinarian*; Janet Stover, *Medicine Resident*; Allan Herron, *Pathology Resident*; Consultants: Roy Bellhorn, *Ophthalmology*; John Budinger, *Pathology*; Robert Byck, *Pharmacology*; Lucy Clausen, *Parasitologist*; Henry Clay Frick II, *Obstetrics and Gynecology*; Harold S. Goldman, *Radiology*; Paul Henkind, *Ophthalmology*; Theodore Kazimiroff, *Dentistry*; Richard Lee, *Internal Medicine*; Raymond Napolitano, *Microbiologist*; Steven Swartz, *Pediatrics*; Jacques Wallach, *Clinical Pathology*; Animal Medical Center, *Pathology*

RECOMMENDED FORM OF BEQUEST

The Trustees of the Society recommend that for estate planning purposes, members and friends consider the following language for use in their Wills:

"To the New York Zoological Society, a not-for-profit, tax-exempt membership organization incorporated by the laws of the State of New York in 1895, having as its principal address the New York Zoological Park, Bronx, New York 10460, I hereby give and bequeath _____
for the Society's general purposes."

If you want to restrict your bequest, please be in touch with Gregory Long of the Development Office, (212) 220-5090. In order to prevent the Society from incurring future administrative costs, it would be helpful if you would consider the addition of the following language to any restrictions which you may wish to impose on your bequest:

"If at some future time, in the judgment of the Trustees of the New York Zoological Society, it is no longer practicable to use the income or principal of this bequest for the purposes intended, the Trustees have the right to use the income or principal for whatever purpose they deem necessary and most closely in accord with the intent described herein."

Howard Phipps, Jr.
President

All photographs, except where credited otherwise, were taken by Bill Meng and Dennis DeMello, staff photographers.



